PRICE $1.00

Construction Methods AND EQUIPMENT

A McGRAW HILL PUBLICATION

FEBRUARY, 1958

At the site of the new Air Force Academy in Colorado, a 100-ton jack post-tensions concrete girders for a highway bridge. The massive units are 120 ft long, 6 ft deep, weigh 96 tons.

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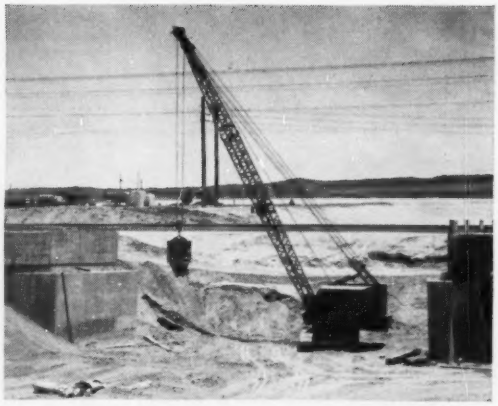
One of Horner Construction Co. cranes on the new U.S. Air Force Academy job. It's rigged with 5/8" 6x19 Yellow Strand Wire Rope.



Horner Construction Co. uses extra high strength "POWERSTEEL" on Air Force Academy access bridge construction

A. S. Horner Construction Co. of Denver has the contract for access highway bridges at the new Air Force Academy near Colorado Springs.

They chose Yellow Strand Wire Rope on their cranes, winches and "carrying towers."

The heavy loads on the crane shown above were easily handled with ¾" 6x19 Yellow Strand "POWERSTEEL" — the extra high strength, extra long life wire rope. Truck winches pulling the towers were equipped with regular Yellow Strand.

A unique feature of the job was the handling of 100-foot, 100-ton prestressed concrete beams. "Carrying towers," riding steel rails, transported the heavy beams into position. The huge concrete forms were supported with Yellow Strand Slings. Horner Construction Co. has been a steady Yellow Strand user for ten years.

You can count on the extra life and dependable service from Yellow Strand Wire Rope. Your B & B distributor is well qualified to recommend the best rope for the job. See him soon. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand®

Wire Rope

B.F.Goodrich report:

Rocks headed for tomorrow's turnpike

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those big rocks are on their way to be crushed into little ones. With millions of tons needed for highway construction, rocks must be handled at low cost. The owners of this crushing plant knew a conveyor belt would be the ideal way—cheaper, faster than the old skip-car method. But the belt would take a terrific beating. That rock is not only heavy, it has sharp, cutting edges, too.

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Savings: After 9 years, and 14 million tons, the B.F.Goodrich belt pictured here is still going strong. Handling costs have gone way down.

Extra benefits: But good as this record is, chances are that it will soon be bettered because of the improvements B. F. Goodrich is constantly making in conveyor belting. In recent years, for example, the use of Nyfil fabrics has resulted in cord belts that last even longer, carry heavier loads, stand even more pounding.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich cord belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-267, Akron 18, Ohio.*

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22 FT SUCTION LIFT

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• The foregoing are typical of the efficiencies of the Griffin Wellpoint systems (several used continuously) on this vast project which involved mile on mile of digging, with the majority of the pipelines laid far below ground water table in deep trenches containing water-bearing sands. Progress rate? Even in many of the swampland sections, it topped 500 ft per day. For "quick-dry" . . . specify . . . Griffin.

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Construction Methods AND EQUIPMENT | **FEBRUARY, 1958**

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CONSTRUCTION METHODS AND EQUIPMENT, February 1958. Established in 1919. Published monthly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948) Founder.

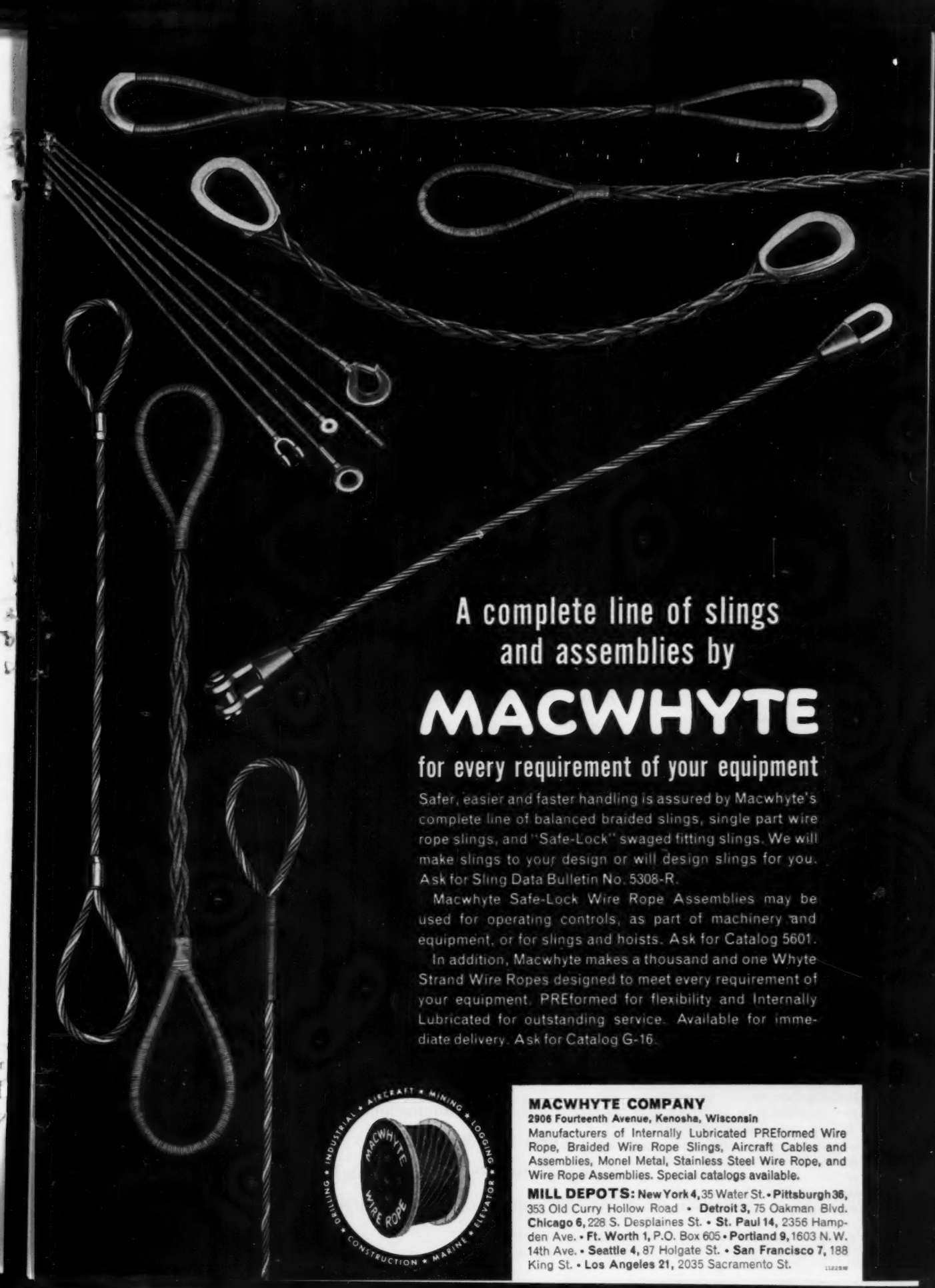
Editorial, Executive, Circulation, and Advertising offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

Subscriptions are solicited only from persons engaged in construction or in supplying the construction industry. Position and company connection must be indicated on subscription orders.

United States subscription rate for individuals in the field of publication $3 per year, single copies $1.00; foreign $15 per year, payable in advance. Second class mail privileges authorized at New York, N. Y. Printed in U.S.A. Title registered in U.S. Patent Office. ©Copyright 1958 by McGraw-Hill Publishing Co., Inc.—All rights Reserved.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, CONSTRUCTION METHODS and EQUIPMENT, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving old as well as new address, and including postal zone if any. If possible, enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to CONSTRUCTION METHODS AND EQUIPMENT, 330 W. 42 St., N.Y. 36, N.Y.



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112258

ON THE COVER

Efficient prestressing, using the Prescon system, was only one of the neat tricks that helped A. S. Horner Construction Co. on its bridge-building job. The Denver contractor cast the girders in direct line with their final position in the structure. Then he rolled them to place, suspended from two gantries that rode temporary steel trusses between piers. See story beginning on Page 76.

Pay Dirt in This Issue

Ingenious Forms Build Concrete Dome .. 80

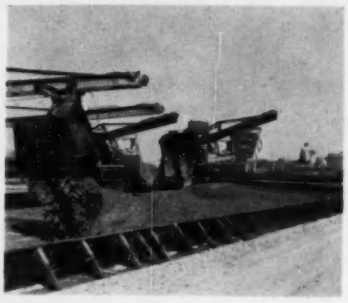
A bee-hive shaped dome to enclose an atomic research reactor offers some challenging formwork problems. Forms must be rugged, yet flexible enough to mould curves.

Try These Tricks For Faster Lining 86

By moving forms with a hydraulically powered jumbo and by placing concrete pneumatically, a contractor lines an average of 128 lineal feet of sewer tunnel daily.

Runway Paving Crew Hits Record Pace 132

Four pavers, manned by an experienced crew, place a record 6,500 cu yd of runway pavement in a single day. Their average daily production on the job is a nifty 5,100 cu yd.



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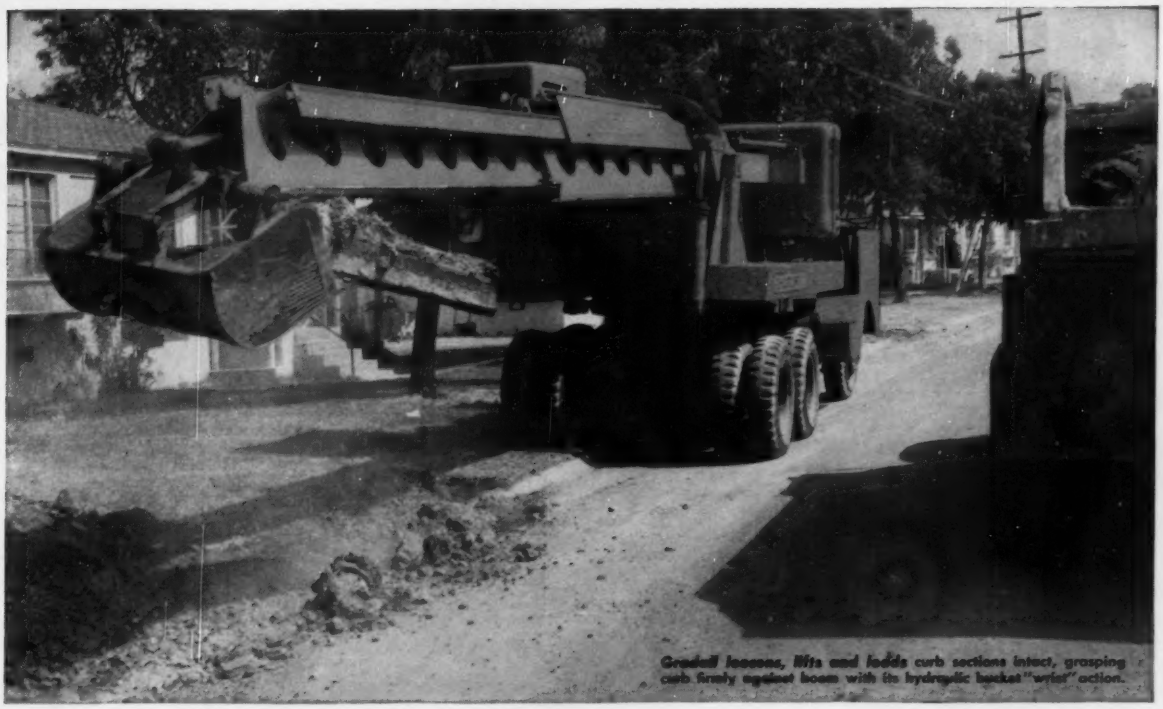
NEXT MONTH

Drilled-in-place caissons will support the New State Department Building and concrete piles an addition to the House Office Building in Washington, D. C. Both methods require special equipment, but both also keep manpower requirements to a minimum.



Gradall loosens, lifts and loads curb sections intact, grasping curb firmly against boom with its hydraulic bucket "wrist" action.

Gradall removes 2400 feet of curb and sidewalk per day!

First, Gradall smoothly breaks out and loads large 4 to 5-foot sections of asphalt sidewalk. Then it efficiently digs out behind the curbing prior to its removal. This machine can easily work under low wires, trees or other obstructions.

Triples previous rate!

That's the average turned in on this 120,000-foot San Diego job by the R. E. Hazard Contracting Company. By the two previous methods used, 800 to 1,000 feet a day was considered very good.

Gradall first removed large sections of sidewalk, then cut out behind the curb, then grasped and loaded out curb sections intact. A cost-saving bonus resulted from the fact that the Gradall method eliminated costly pavement damage during curb removal.

Supt. Wayne W. Wallace states: "There is no way at all you can take it out cheaper than with a Gradall."

Since delivery in December, 1954, Hazard's Gradall has averaged over 200 on-the-job hours every month! They keep this multi-purpose machine busy on a wide variety of jobs—often on work no other machine could touch—jobs where Gradall's power and arm-action accuracy really pay off.

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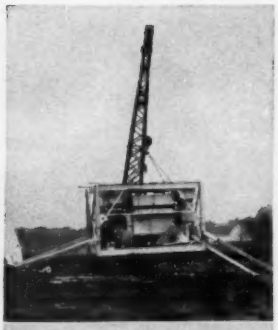
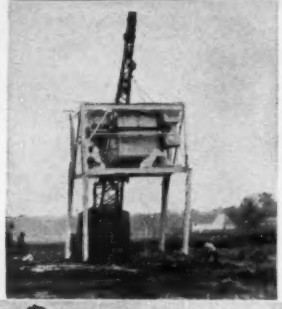


Batchers come as a complete unit with all bracing, automatic controls, weighing equipment, piping and wiring all in place. Here crane lifts batcher section. Support columns, hinged to batcher frame, swing into place as batchers are raised.



Almost up. Minimum of field bolts hold columns securely.

Crane lifts complete compartmented bin section, places it on top of batchers.

Attach one piece elevator and the BUTLER HP-85 is ready to go.

WITH the new BUTLER HP-85 you have capacity — (200-plus yards an hour) — fully equivalent to a permanent Ready Mixed Concrete Plant. Yet you have an ease of transport and fast erection previously enjoyed only by a highway contractor.

No longer are you limited by high mileage costs of transit-mix trucks.

Your HP-85 *is at the job-site*. Truck mileage is cut enormously. Low-bed trailers bring your HP-85 to the job today . . . You're in production tomorrow! Fully automatic, the HP-85 is handled *by only one man*. Operates at low speeds too; economical operation for any production requirement.

BUTLER BIN COMPANY
949 Blackstone Avenue
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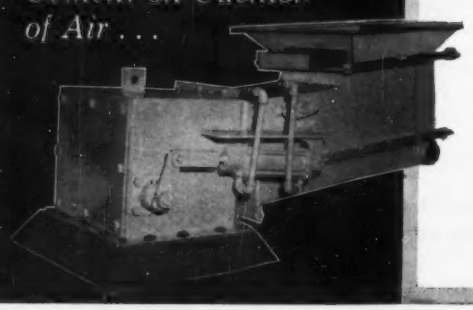
New Principle Feeds Cement on Cushion of Air . . .



the BUTLER AIRFLOMATIC CEMENT FEEDER

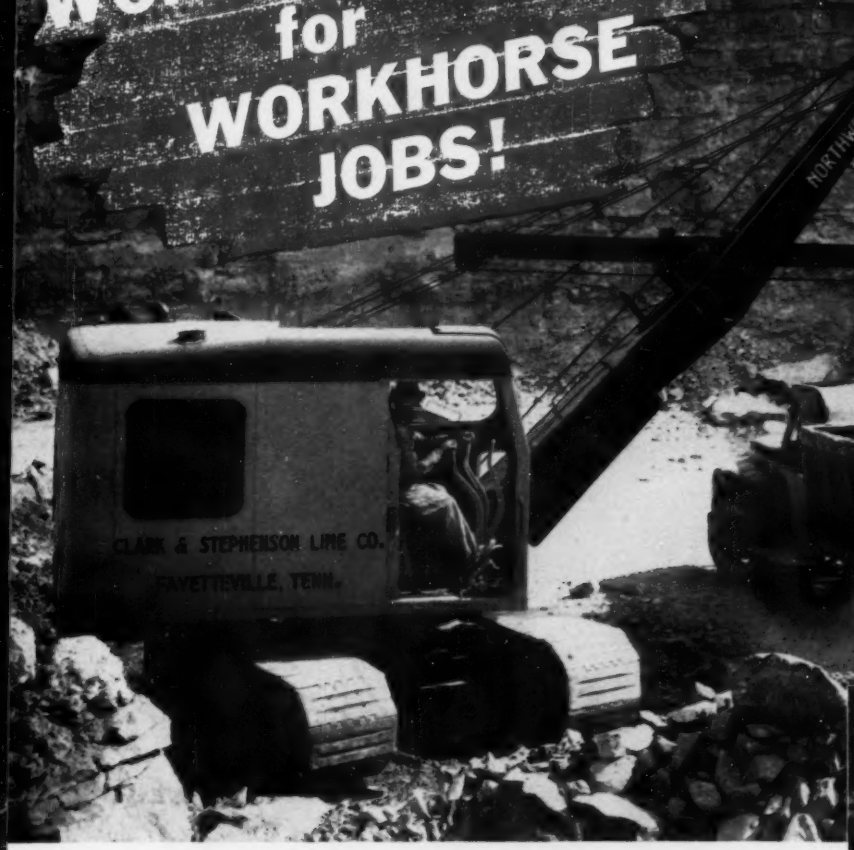
Cement rides on a cushion of high volume, low pressure air, provides high precision positive feeding at all times. No moving parts, no pins or bolts to shear. Air supplied by blower which also aerates cement in the overhead bin. Jets for additional air can often be omitted.

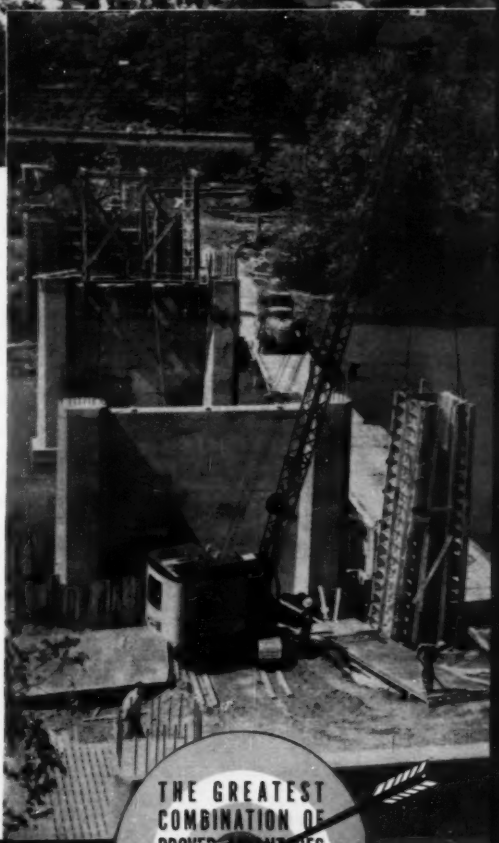
Butler Airflowmatic easily installed on all Ready Mixed Concrete or Road Batching Plants regardless of make. Write for full information about installation of Airflowmatic on your plant, giving name of manufacturer.

A WORKHORSE RIG for WORKHORSE JOBS!

NORTHWEST

3/4 YD. MODEL 25





You don't have to take anybody's word—you don't have to believe the advertising on the Northwest Model 25's superiority. Go out and take a look at it in rock digging. Then compare it with *any other ¾ yd. rig on the market.*

It's the workhorse of the industry. These rigs load fast! Here is plenty of power combined with the Northwest Dual Independent Crowd that utilizes force other independent crowd shovels *waste.* No stutter—no restarts—no dipper juggling either in the bank or getting the load to the truck.

Compare it as a Pullshovel, Dragline or Crane. It's easy to convert. Booms are sturdier for workhorse digging and lifting. Swing Clutches are Uniform Pressure Clutches that eliminate the jerks and grabs that reduce output. The "Feather-Touch" Clutch Control gives ease of operation, without resorting to delicate mechanisms, valves, pumps and piping and at the same time retains the *feel of the load.*

There is a wide range of boom hoist equipment with which to meet your problem. There is flexibility in crawler dimensions. It is an answer to every problem where ¾ yd. capacity is the right size, and you have a full ¾ yd. machine that will handle work that smaller machines of the same rated capacity can't handle.

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Chassis, wheel bearings and general grease lubrication	Texaco Marfak	Stays in the bearings; gives long-lasting extra protection against wear and rust
Track rolls	Texaco Track Roll Lubricant	Seals itself in, seals out dirt and moisture.
Hydraulic units	Texaco Regal Oil R&O	Keeps systems free from rust, sludge and foam
Wire rope and open gears	Texaco Crater	Keeps wire rope strong longer, assures smoother operation and longer gear life
Enclosed reduction gears	Texaco Gear Lube HD	Protects against wear under heavy loads, keeps gears running smoothly.

It doesn't take long for students at Western National School of Heavy Equipment Operation, Weiser, Idaho, to realize there's more to grading or bulldozing than moving dirt. They soon find out that a contractor's earth-moving equipment is expensive—and requires the best of care.

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Because of this training, Western graduates

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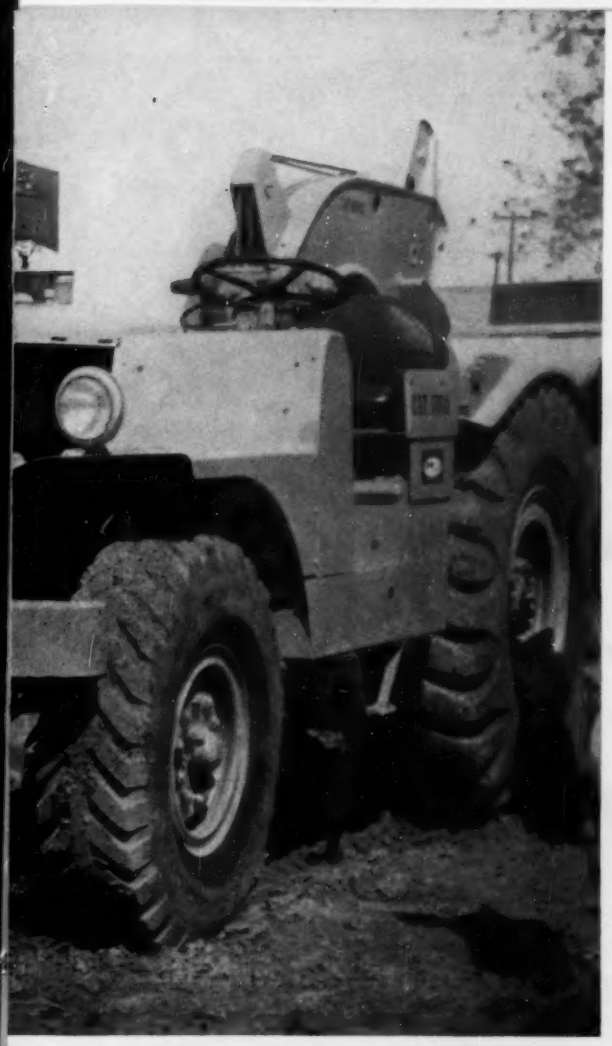

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and maintenance

make good all 'round operators of graders, scrapers, cranes and tractors—the kind who can handle and care for your equipment properly, and keep it on the "go."

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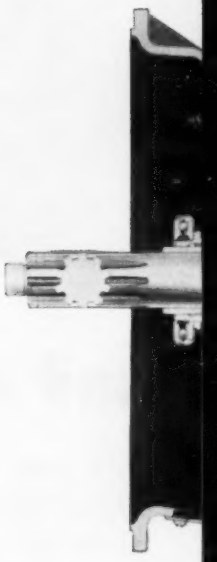
...for off-highway service with the *LARGEST automotive diesel engines built!*



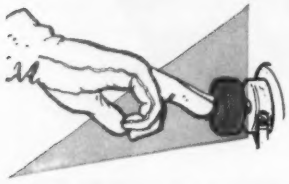
This NEW ROADRANGER® is the *largest* heavy-duty *semi-automatic* transmission designed specifically for big earthmoving, mining and quarrying equipment where *maximum capacity* and *long wear life* are essential.

The model R-1550 offers 9 forward ratios and 2 reverse ratios all controlled with *one gear shift lever.* This transmission with overdrive in ninth has short, even steps between gear ratios which average 38%.

The model R-1550 is designed for diesel engines in the 1550 cu. in. class developing up to 600 hp.

Specify the brand new R-1550 Fuller Semi-Automatic ROADRANGER Transmission by name. Assure faster work cycles, lower fuel consumption, longer engine life, less operator fatigue . . . greater profits. Check with your equipment dealer for the most efficient, easiest shifting Fuller Transmission to meet your specific operating requirements.

NEW... AIR POWERED COUNTERSHAFT INERTIA BRAKE

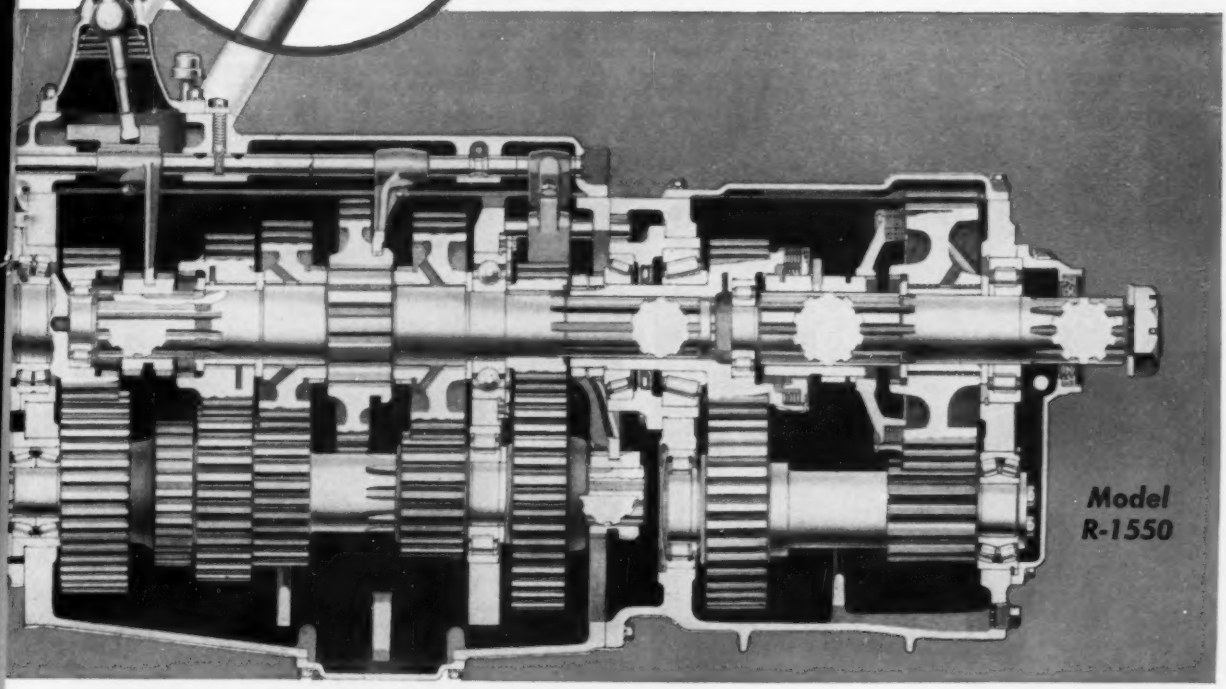


This simple button, provides for quick up-shifts without double clutching. By simply pushing this button before each up shift, the countershaft inertia brake is activated when the transmission is in neutral, allowing for immediate engagement of the next higher gear ratio.

Fuller TRANSMISSIONS®

FULLER MANUFACTURING COMPANY • ***Transmission Division, Kalamazoo, Mich.***

TRANSMISSION



R-1550 Transmission

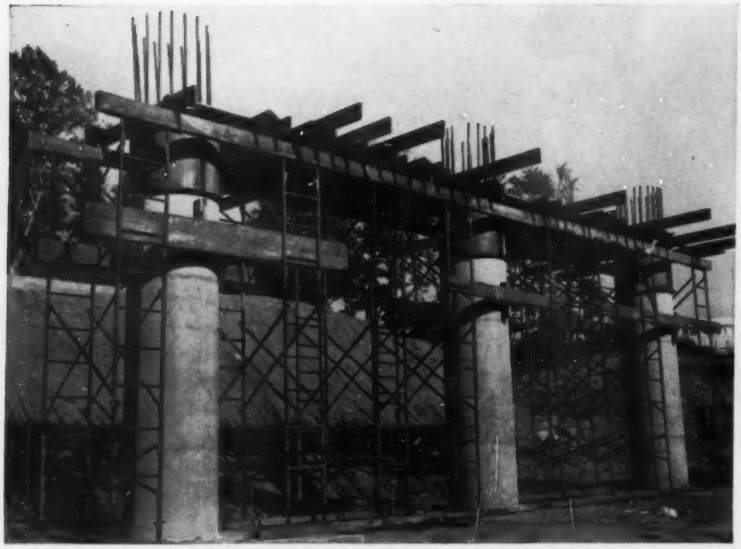
9 forward ratios

2 reverse ratios

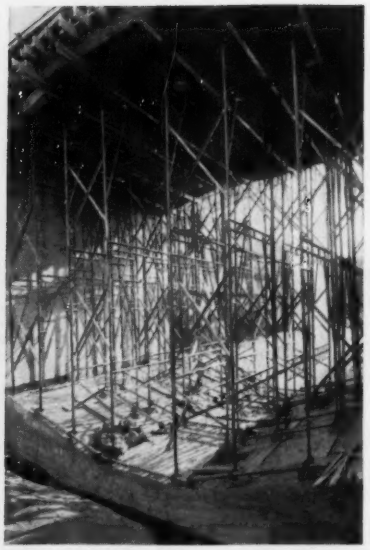
1 gear shift lever

Short, even steps between gear ratios which average 38%

GEAR	RATIOS	% STEP	
Ninth	.69	44.93	High Range
Eighth	1.00	40.0	
Seventh	1.40	40.0	
Sixth	1.96	33.7	
Fifth	2.62		
RANGE SHIFT		34.7	
Fourth	3.53	39.94	Low Range
Third	4.94	39.88	
Second	6.91	38.35	
First	9.56		
Reverse	2.71	High Range	
Reverse	9.56	Low Range	

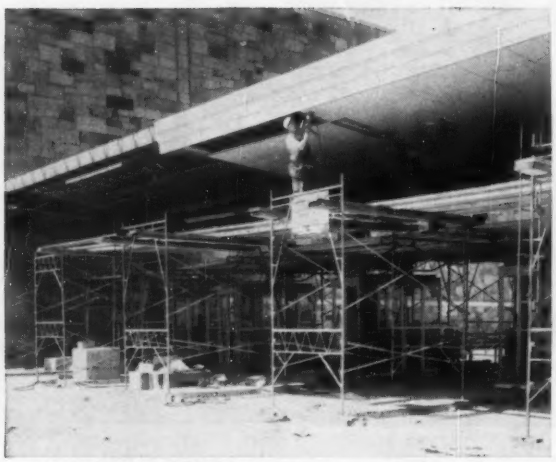


QUICK PIER BEAM SUPPORT—"Trouble Saver" 2'-wide Ladder Scaffold frames spaced 5' apart help contractor, M.D.A. Construction Co. provide easy access for forming work and support for one of 20 bridge piers on the Cross-Westchester Expressway, White Plains, N.Y. This photo shows forming and support for a pier beam 42" x 48" deep, 14' high. Many users of "Trouble Saver" Shoring say "its ease of handling means quicker job completion." Complete, accurate shoring layouts are a regular part of PS Co's engineering service available thru nation-wide offices or representatives that *sell* or *rent* "Gold Medal"® Scaffolds.



CONFORMING TO CURVES—Guy F. Atkinson Co., contractor, uses "Trouble Saver" Shoring to support Pacific Electric Ry. Co. concrete bridge, Los Angeles, over a sloped concrete channel base. Adjustable legs help meet both curves, top and bottom. Note 4" steel I-beams as stringers, furnished by PS Co.

Shoring Methods . . . for Highway Construction by The Patent Scaffolding Co., Inc.



FINISHING OPERATIONS—On toll booths at the New Jersey Plaza for the New York—New Jersey Lincoln Tunnel these "Trouble Saver" fixed Scaffolds are used to provide safe, level platforms for finishing work. The scaffolding components used here are the same as those used for shoring operations. By assembling them in towers and spacing to take the load, practically any shoring job can be done.

EASILY HANDLED BRIDGE SHORING—5'-wide prefab "Trouble Saver" Sectional Steel Shoring frames are handled easily by the crew for T. M. Page and RCT Corp., joint venturers, to obtain the correct support for the Cajon Blvd. Bridge over Devil's Creek Diversion Channel, San Bernadino, Calif. Two 6'6"-high frames, with extension legs, give 14' height. 4" steel I-beams used as stringers. 3'7" spacing between frames.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDING

THE PATENT SCAFFOLDING CO., Inc.

®

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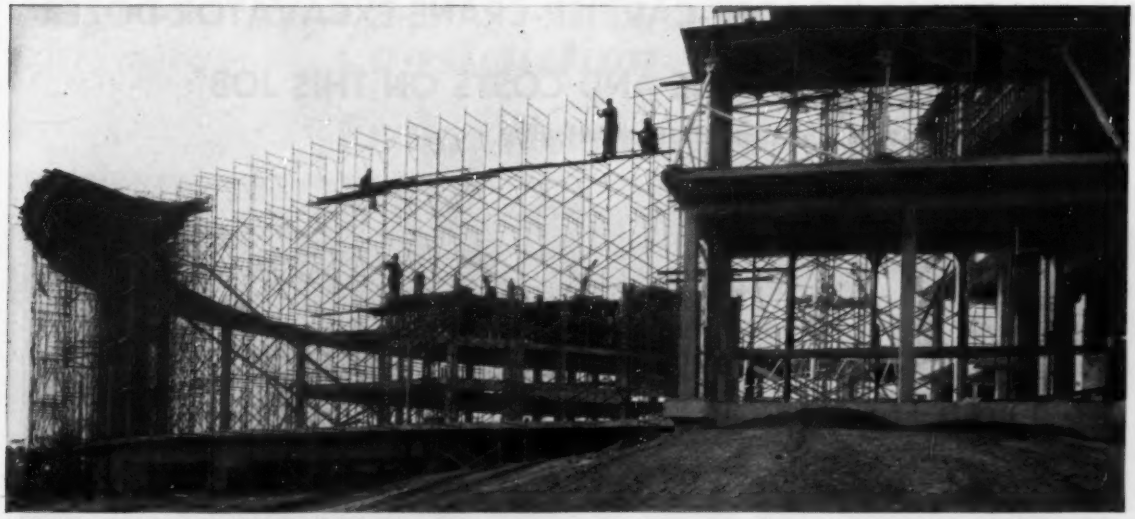
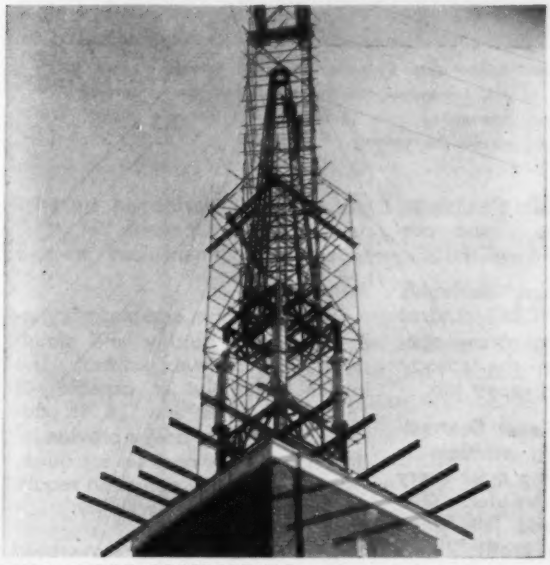
To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

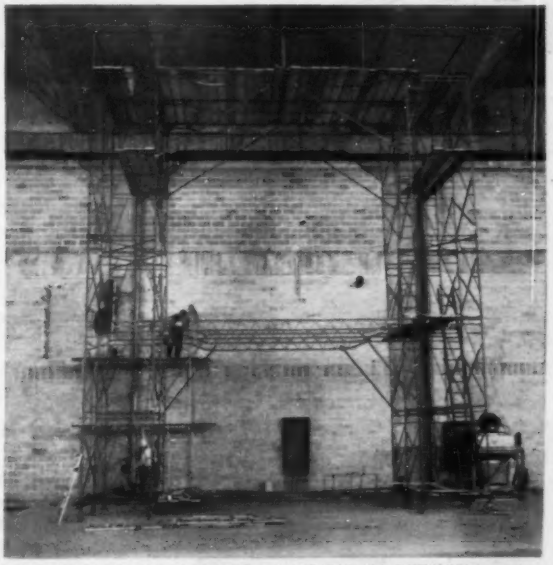


SUPPORTS 270' CONCRETE CANOPY— Handling form work and providing support for circular concrete canopy around the new Municipal Auditorium, Austin, Texas, is simplified for contractor, J. J. Stokes Construction Co., by the use of modern prefab "Trouble Saver"® Steel Shoring. 580 frames are quickly and easily assembled to provide the shoring needed. Planking laid across the tops of frames also provides working platforms. By using this shoring technique the contractor cuts forming costs all along the line. "Trouble Saver" frames are 5' wide and range in height from 3' to 10', providing broad application variations to meet any scaffolding or shoring job for efficient, lower cost construction.

Scaffolding Methods . . . by Patent Scaffolding Co.



TWO-STAGE SCAFFOLDING— Contractor, Miller Davis Co., uses 3870' of "TubeLox"® Scaffolding for building a steel roof on this 215' spire. After upper portion is done, scaffold is dismantled and re-erected on the I-beams for heavier lower work. New Goodrich Mem. Chapel, Albion, Mich. Made with only four basic parts, this scaffolding is erected rapidly to conform to any shape, size or contour. Variable tube lengths, from 6' to 20', and adjustable couplers assemble to meet job conditions.



ELECTRICIANS' ROLLING TANDEM SCAFFOLD— These two towers are each made of five sections of 6'6" "Trouble Saver" Scaffolding frames set on casters, truss-joined at two points and braced at the bottom with "TubeLox" Scaffolding. They permit the contractor, J. Livingston & Co., to roll along 33'6"-high for electrical work on hangar #12, Idlewild Airport, N. Y. C. "Trouble Saver" Scaffolding accessories permit unlimited scaffolding design and use.

For complete details on PS Co. scaffolding equipment especially designed for safer, more efficient, lower cost working platforms and support for concrete construction, *check coupon for Catalog "A".*

Facts on how to cut forming costs at least 25% are fully described in special booklet, "How to Use Steel Shoring and Scaffolding in Highway Construction". *Check coupon for Bulletin G208.*

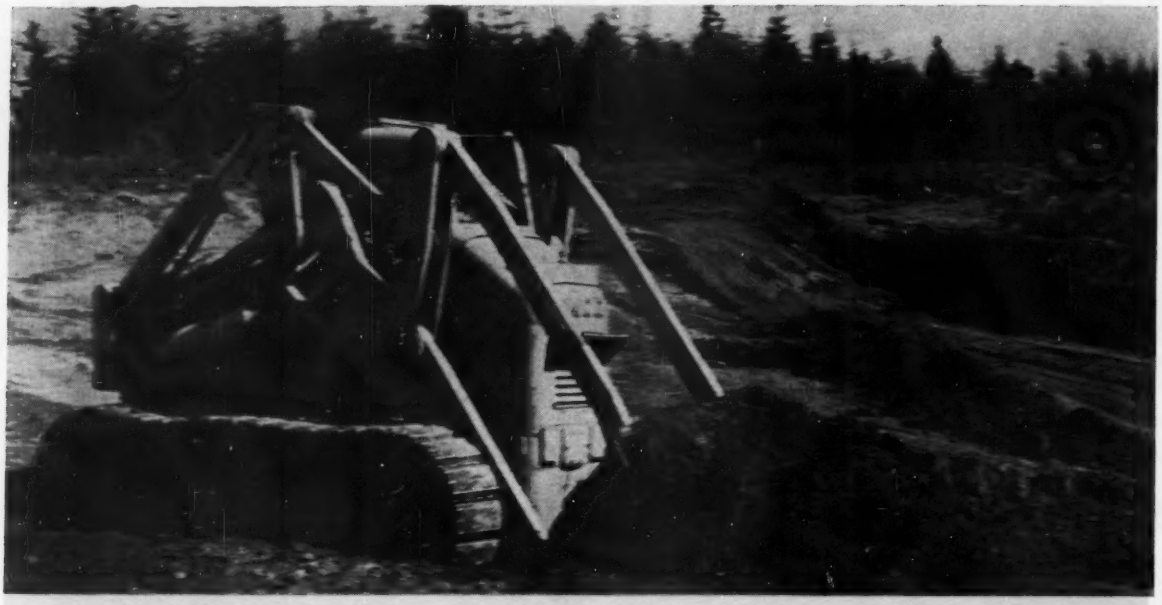
CLIP THIS COUPON AND ATTACH TO YOUR LETTERHEAD

Send Catalog "A" ☐ Send Bulletin G208 ☐

Your Name_____

"OUR EIMCO 105 'LOADER-CARRIER-CRANE-EXCAVATOR-DOZER' SURE SAVED TIME AND COSTS ON THIS JOB"

. . . Says Coast Contractors' President, Frank McHugh



TACOMA, WASH. - Debris loosened by flash floods clogged culvert drainage and 100 feet of county roadbed were washed out. Contracted to handle the "rush" repair job, COAST CONTRACTORS INC. moved their Eimco 105 Front-End Loader on the site. The versatile Eimco cleared debris; dug and dozed its own access way to the bottom of the gully; trenched and graded a new culvert; transported and positioned 48" concrete piping, and (above) rebuilds the roadway.

NOW IT'S A CRANE! Coast Contractor's work crew comes up with a cable hitch attachment that converts the Eimco 105 into a crane for positioning pipe. NOTE: Loader's tough construction, high reach . . . operator visibility . . . tractor stability (with weight on slope side).

"Equipment has to be flexible to fit into our scheme . . . and our Eimco 105 has proven — IT FITS!"

The object of **Frank McHugh's** praise — an Eimco 105 Front-End Loader — "subbed" for many specialized machines in the speedy completion of a road repair job.

As president of Coast Contractors Inc., Frank's big problem is the same as that facing most every general contractor - builder: Getting a variety of odd jobs done fast without having profit "chewed up" by special equipment investments, labor and maintenance costs.

The Eimco 105 is a "hell-for-stout" earthmover with 40,000 lbs. breakout power to handle "tough" jobs normally performed by specialized big equipment. Yet, it is faster and outmaneuvers tractors half its size.

Hydraulic boom and bucket cylinders respond quickly and simultaneously to lever control. The loader assembly is capable of 15,000 lb. lifts and 14 ft. discharge. Two final drives provide independent track reversal for quick, sharp turns or any operation requiring extreme maneuverability.

The Front-End Loader's overhead loading companion (Eimco 105 Excavator) provides discharge without turning plus these features.

Get the facts on both of these versatile machines before you buy!

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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B 308

Construction News From Washington

Washington, D.C.
February, 1958

The Year Ahead

President Eisenhower's economic advisors are counting heavily on construction to push the general level of business activity higher by mid-year. The President's budget message to Congress pegs 1959 federal construction spending at a post-war peak of $7.2 billion, up more than $1 billion from last year. And the Administration has begun an easing of credit controls that will help make more funds available for construction of all types.

Federal budget for the fiscal years 1959 is nearly 10% construction money. Part of the budgeted increase is for military construction to combat the Soviet threat in the missile age. But most of the rise results from a continuing increase in spending for civil programs—particularly highways.

Some civil construction activities, however, will drop to lower levels in later years if Administration plans carry through. President Eisenhower would like to save several billion dollars in civil programs within the next few years to offset higher spending for missiles and the like. A good share of these savings would come out of public works construction.

A Spending Congress

Congress will call the turn on future federal construction spending. And you can bet that Congress, in this election year, will vote at least as much as the President recommends for most programs.

In addition, Congressmen are likely to beef up other programs the President would like to curtail or eliminate. A major issue, of course, will be the ban on new starts for water resources projects. Look for Congressional leaders to make a strong fight against Administration plans to economize here. And the odds are that at least some new starts will be voted despite the President's opposition.

Congress also may be expected to turn down Administration plans for shifting a greater share of urban renewal costs to the cities and for raising interest rates on college housing loans.

A hard fight will be made in Congress to authorize additional public housing units for fiscal 1959, again to assure an uninterrupted program. The President contends that no new authorization is needed, but his recommendation may be overruled.

Corps of Engineers

Despite the shutoff on new starts, construction expenditure of the Army Engineers for flood control and rivers and harbors projects will go up to $520 million in 1959 fiscal year. That is $35 million above the estimate for the current year. Increasing construction output by contractors on projects started in earlier years accounts for the rise.

continued on next page

To take care of the heavy expenditures, the President requests an overall civil works appropriation for the Corps only $10 million less than the $636 million that Congress voted for the current year. The request includes $491 million for construction outlays, practically unchanged from this year.

Reclamation

Two big reclamation contracts scheduled for advertising this winter have been postponed indefinitely as a result of the ban on new starts. There is no money in the President's budget for the power dam on the $83-million Flaming Gorge Project or the earthfill dam on the $37-million Navajo Project, both in the upper Colorado River basin.

In spite of the freeze on new starts, however, the Administration budget estimates construction spending on reclamation jobs next year at $169 million, an increase of $17 million above the figure for the current year.

Total appropriations requested in the budget for the Reclamation Bureau exceed the amount voted last June by nearly $20 million.

Highways

The big federal-aid highway program is sure to boom next year. Grants to the states for highway construction are budgeted to increase by nearly $600 million to more than $2.3 billion in fiscal 1959.

Money for the highway program, of course, has to come out of the Highway Trust Fund. As an economy move, the President is asking Congress to amend original provisions in a way that would take something like $75 million to $100 million a year from the fund for other purposes.

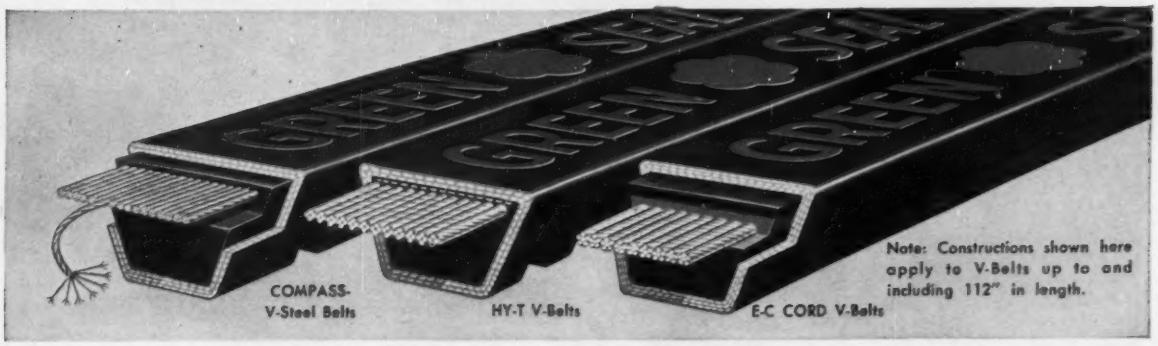
With allowance for these changes, receipts flowing into the fund next year would be only $2.18 billion, as compared with expenditures of nearly $2.5 billion. Congressmen are likley to oppose strongly these proposed diversions from the Highway Trust Fund.

Military Construction

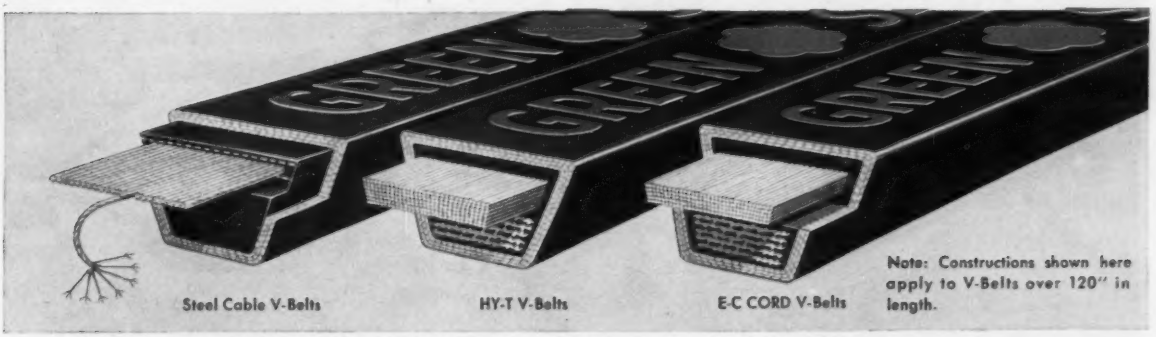
To maintain retaliatory striking power during the first stages of missile buildup, the budget calls for $2.1 billion of new military construction money. Congress is making $520 million of this sum available to the Air Force immediately. The remainder is requested for the fiscal year starting July 1: $965 million to the Air Force, $320 million to the Army, and $290 million to the Navy. These funds will increase military construction spending to $1.96 billion in the current year and to more than $2.1 billion in fiscal 1959.

Construction of additional dispersed bomber bases, new missile launching sites, and extended missile detection systems will be speeded up before June 30. Between now and the end of June next year, the Air Force will spend $550 million on construction to improve dispersal and alert readiness of the Strategic Air Command. In the same period, some $900 million will be spent on missile sites and radar fences.

What's different about


COMPASS-
V-Steel Belts
HY-T V-Belts
E-C CORD V-Belts
Note: Constructions shown here apply to V-Belts up to and including 112" in length.

V-Belts with the Green Seal?



Plenty—when you're belting multiple drives. For that Green Seal certifies the dimensional stability of every belt that carries it. There's no surer guarantee that every belt in a set will match every other one—perfectly. And that they'll *stay* matched no matter how long you stock them before installation.

So the dimensional stability of Green Seal belts is solid protection against "loafing," slipping, stretching, scorching and other mismatching troubles. And most of the credit belongs to the belts' load carriers of airplane-type steel cables or Triple-Tempered (3-T) cord – Goodyear "exclusive" cord that's carefully tempered with Tension, Temperature and Time.

This unique 3-T process brings the synthetic cord to its point of greatest strength and stability. Result: the end of shrinkage in storage—plus greatest shock- and stretch-resistance in use. All of which assures you maximum, trouble-free horsepower hours at minimum cost. Why settle for less?

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tire & Rubber Company, Dept. 794, Akron 16, Ohio

Please send me complete information on what makes V-Belts with the Green Seal different from any others made today.

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Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

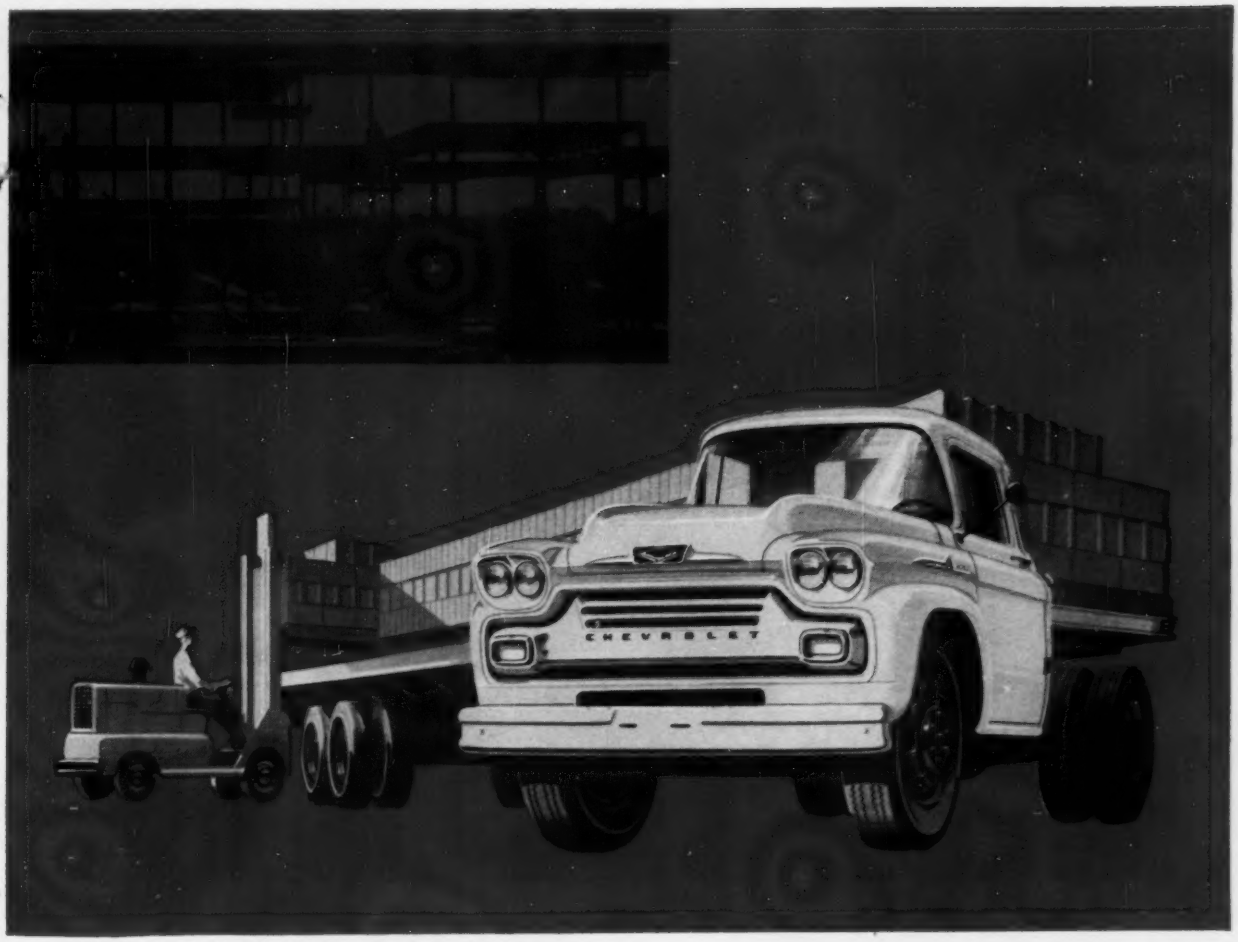
Never before has Chevy been

Here's a truck specially designed to take to your kind of work like a duck takes to water! It's Chevrolet for '58 with new hustle, muscle and style that mean money in your pocket!

As you can see, Chevy's a honey of a truck this year, and that handsome, broad-shouldered '58 appearance only hints at the host of new and improved features that are ready to put you dollars ahead in the years to come. *Here's a truck ideally suited for haulers in your line of work.* In styling, for instance, Chevrolet for '58 has what it takes to build your business prestige every day in the week: new dual headlamps, new massive grille, newly contoured hood, new cab beauty, to mention just a few innovations.

And what workers these new heavyweights are! There's new power to whip mammoth hauls from the industry's newest engine, the 230-h.p. Work-

CHEVROLET **NEW CHEVROLET**



so right for big construction jobs!

master V8* with revolutionary Wedge-Head design. This engine is new and different right down to the core. The combustion chambers, for instance, are *wedge-shaped* and located in the cylinder block rather than in the cylinder head. And the cylinder block is machined to a 16-degree slant, while the piston heads are peaked rather than flat, as in most other engines. This design gets maximum combustion turbulence from fuel, maximum power and mileage from each drop of gasoline burned. It equalizes the work loads on pistons to smooth out performance and reduce engine wear.

G.V.W.'s go all the way up to 36,000 lbs. on Triple-Torque tandem models for big, profitable payloads. And these trucks come equipped with the toughest of big truck chassis components, either as standard equipment or as extra-cost options: Powermatic transmission, cast spoke or disc wheels, air-hydraulic brakes, full-air brakes or big Hydrovac power brakes, and smooth Synchro-Mesh transmissions to meet your needs precisely.

There are many such reasons why Chevy's never been *so right* for your work—many more reasons why you'll want to see your Chevrolet dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Featured in Series 90 and 100.*

TASK · FORCE 58 TRUCKS

(Advertisement)

JAEGER'S 50 CFM MORE AIR SPEEDS RUSH WORK

By producing 365, not 315, cfm of 100 lb. air, this Jaeger Rotary is operating six 80 lb. breakers at full efficiency to finish a rush job in busy Benjamin Franklin Parkway, Philadelphia. Full load speed only 1700 rpm.

FULL AIR PRESSURE AT 5200′ ELEVATION

Installing cable for Denver, Colorado utility, this Jaeger "125" Rotary is holding full pressure in two Thor heavy duty breakers. Full load speed is only 1700 rpm. Jaeger originated the 125 cfm compressor rating.

JAEGER'S 125 AND 250 CFM SIZES ON 2-WHEELS

Jaeger 125 and 250 rotaries give you the advantages of Jaeger's higher efficiency (1700 rpm full load speed instead of 1800-1950), plus full size tool boxes, retractable pneumatic-tired dolly wheel and 8-hour fuel tanks, with 2-wheel mounting. Four-wheel units are available in 365 and 600 cfm sizes.

Your Jaeger distributor will gladly give you full details and demonstration — or let us send you Catalog JCR-5.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Co. of Canada, Ltd., St. Thomas, Ontario

Sturdier construction, combined with exceptional stability and 180° foot-pedal swing-control, enable the Case "320" industrial backhoe to outperform competitive rigs costing as much as $2000 more.

Home-builder says: "CASE® '320' CUTS SEWER and WATER INSTALLATION COSTS in HALF"

HARVEY CONSTRUCTION CO., 2126 Highland Park Way, St. Paul, Minn., is constantly looking for *new ways to* cut costs, and improve job efficiency on their *1200-home* Woodbury Heights development.

As a result, they recently traded their converted *farm-type* power-digger, for a new Case "320" *industrial* loader-backhoe combination. The Case unit was selected after a thorough competitive demonstration, because of its heavier construction, superior performance *and lower cost.*

Unit-cost per home reduced

Company records prove the choice was a wise one because the Case "320" has already *cut the cost of digging and backfilling water service lines and sewer systems by 50 per cent.*

Says owner Harvey Lubov: "We've been able to greatly decrease our unit-cost per home for installing water and sewer systems. Because the Case backhoe has more power and is easier to maneuver, it can dig an average trench—7 ft. deep, 3 ft. wide at the bottom, and 65 ft. long—in an hour and a half. We now complete *four* such installations per day, compared with only *two* per day with our former machine. We've also cut the time of installing septic tanks and drain fields by 33 to 50 per cent."

Handles utility jobs!

Lubov saves additional time and labor by using the "320" for various handy-man jobs. With the 13-cu. ft. hydraulic self-leveling loader, he loads trucks, lifts materials, cuts sidewalks and driveways, fine-grades and spreads gravel with the machine, instead of by hand. Says Lubov, "The Case rig is big enough to do a fast job, yet small enough so it doesn't damage new foundations."

You, too, can save money and increase efficiency with a Case "320" backhoe-loader. See your nearest Case Industrial Dealer today, or mail handy coupon below.

Lubov's operator says the high-speed Case shuttle transmission and "one-finger" power-steering are a big advantage on loader jobs. Wheels do not jackknife when turning, and the big tires do not "sink-in" under heavy loads, as former machine did. He also appreciates the ease of reaching all tractor-controls from the backhoe seat.

CASE®

1st in quality for over 100 years

INDUSTRIAL WHEEL and CRAWLER
TRACTORS • LOADERS • DOZERS
BACKHOES • FORK LIFTS

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J. I. CASE CO., Dept. B1498, Racine, Wis., U.S.A.

☐ Send free catalog on Case "320" Backhoe-Loader
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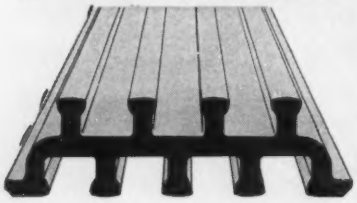
C-BL-91

LABYRINTH® WATERSTOPS

A SOUND INVESTMENT FOR CONCRETE CONSTRUCTION!



LABYRINTH AVAILABLE IN 2, 3 or 4 rib.

ON YOUR CONSTRUCTION:

1. Consider the investment in design, materials and labor (to mention a few).

2. Then consider how important safe, secure *watertight* concrete joints are.

3. Thorough watertightness *can* be secured by installing Labyrinth Waterstops —a dividend that makes the low initial cost of the product insignificant when compared to your total investment—and one that insures watertight concrete joints for years!

- Corrugated ribs grip concrete, insure an everlasting bond between joints.
- Finest polyvinyl plastic resists chemical action, aging, severe weather.
- Takes just seconds to nail to form . . . easy to cut and splice on location (prefabricated fittings available).
- There's a Water Seal product for every type of concrete work!

If your aim is to stop water seepage, *stop it effectively with Water Seals' Waterstops!*

"See Us in SWEET'S"

New Literature and Free Samples Sent on Request—Use Coupon Below

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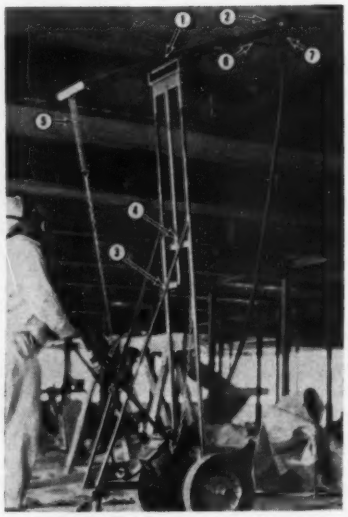
Job Talk...

Grid Slab Forms Go "Over the Side"

Corbetta Construction Corp. workmen strip grid slab forms from under ceilings of an airplane hangar at New York International Airport and throw them over the building's side. Sounds weird but an idea taken from a circus makes stripping the forms easy and fast. Key to the idea is a trampolin made up of a few bits of reinforcing steel and rope. When a workman throws the tin pan over the side it falls on the trampolin then bounces off onto hay scattered nearby. A workman on the ground simply picks up the undamaged pan and places it on a stack. Saves time.

Grinder Speeds High Ceiling Polishing



Here's an adjustable machine that will cut grinding the underside of concrete ceilings to half the time normally taken with portable flexible shaft grinders. Put out by Stow Manufacturing Co., the machine not only removes fins from the concrete's underside but actually cuts away nails left protruding by forms. An average operator can finish up to 4,000 sq ft daily.

Production is a far cry from the days when a workman was expected to turn in a hard 500 sq ft daily by the old method of setting up scaffold planks over horses and grinding a section.

To operate the machine, (it can work to ceiling heights of up to 16 ft) the operator sets the pivot arm (1) at about a 45-deg angle. He then adjusts the 9-in. grinding disc (2) to the proper height by lifting up on the handle in the center (3). A ratchet arrangement (4) automatically locks it in position at the desired height while a slight pressure is put on the grinding disc by the spring and chain assembly (5) at the opposite end of the pivot arm. A turnbuckle (6) helps get the most desirable grinding angle while a spring arrangement built into the bearing housing (7) supports the grinding disc and absorbs any shocks. A 1-hp totally enclosed motor actuates the grinder.

continued on page 27

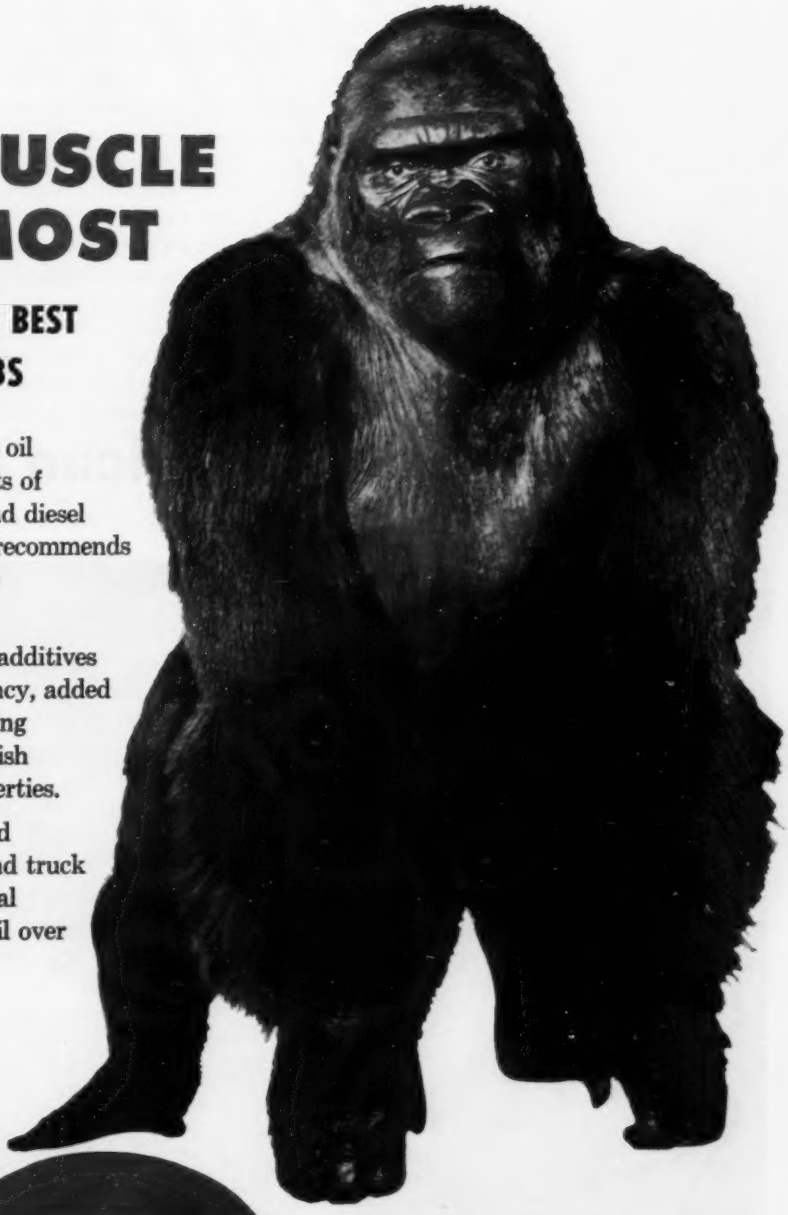
WHERE MUSCLE COUNTS MOST

AMOCO HDX OIL WORKS BEST FOR HEAVY-DUTY JOBS

Amoco HDX Oil is a heavy duty oil designed to meet the requirements of today's most exacting gasoline and diesel engines where the manufacturer recommends an oil conforming to API Service Designation "DG".

HDX insures clean engines. The additives used provide exceptional detergency, added stability, protection against bearing corrosion, high resistance to varnish formation and anti-foaming properties.

Satisfied customers including road contractors, coal strippers, bus and truck operators, attest to the exceptional record of this great heavy duty oil over many years of service.



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When you want top performance, you want Amoco

AMERICAN OIL COMPANY, 555 Fifth Ave., New York, N. Y.

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Vesuvius "X" Gear Compounds

5 great American rope tricks . . .

TO CHANGE A MAN'S MIND. Tiger Brand Wire Rope Drilling Line lasted nearly twice as long as the driller of this rotary rig expected. This is typical Tiger Brand performance in the oil fields.

TO SPEED A SEAWAY. Here, at Long Sault Dam, and at most other projects on the St. Lawrence Seaway, Tiger Brand Wire Rope and its ability to take hard, grueling, continuous punishment played a vital part in construction. In fact, wire rope was so important that American Steel & Wire set up a special warehouse at Massena, New York, just to serve the Seaway contractors. Tiger Brand Wire Rope helped speed dredging, materials handling, form setting and concrete pouring.

THE PICTURES BELOW show just five of the thousands of tricks that USS Tiger Brand Wire Rope is performing today.

You also will find it on elevators that speed office workers safely up and down modern skyscrapers. You will find it protecting the lives of motorists on high-speed superhighways. You will find it scooping shrimp off the ocean bottom . . . carrying steel from the open hearth to the mold . . . dredging rivers . . . snaking logs through the timber forest.

Everyday, every one of us meets Tiger Brand Wire Rope and benefits. It helps us to build . . . it helps us to move . . . it helps to keep us safe. There is no industry in America that does not depend, in some important way, on the strength and quality of Tiger Brand Wire Rope.

For fast delivery of Tiger Brand Wire Rope, call our distributor near you. American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

TO MOVE A MOUNTAIN. Equipped with strong, durable Tiger Brand Wire Rope, this giant power shovel can handle 100,000 tons of material daily. Long rope service is vital.

TO HARASS A HURRICANE. Thirty sturdy Tiger Brand Wire Rope guy lines brace this TV tower against winds of 155 mph. The tallest tower in Texas, it serves stations WFAA-TV and KRLD-TV . . . is 1,521 feet high . . . required 38,682 feet of Tiger Brand Wire Rope.

TO SUPPORT TRAFFIC. Two million vehicles a year will use the history-making Mackinac Bridge in upper Michigan. Its safety depends on Tiger Brand Wire Rope and Bridge Wire—enough to go almost twice around the world.

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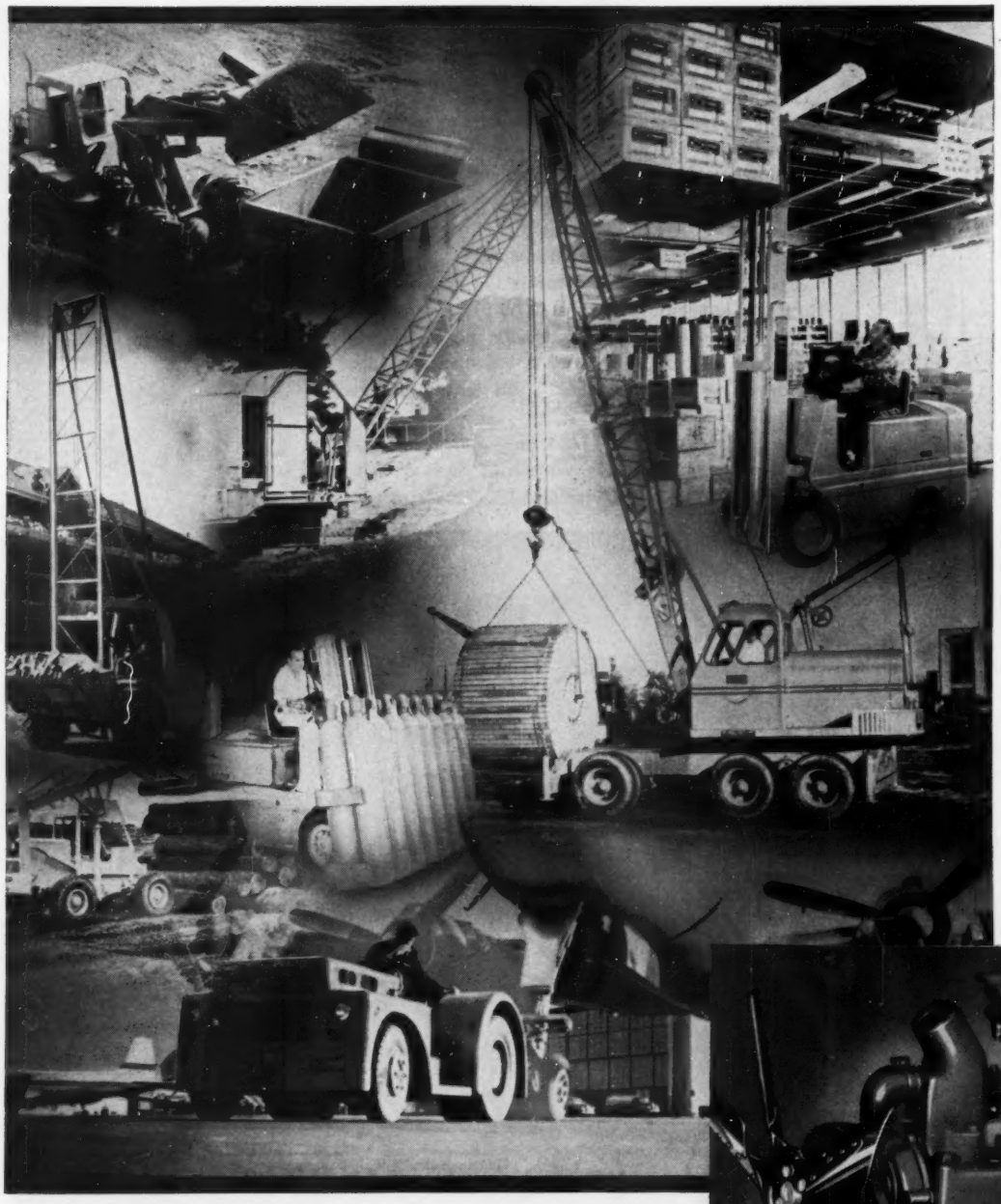
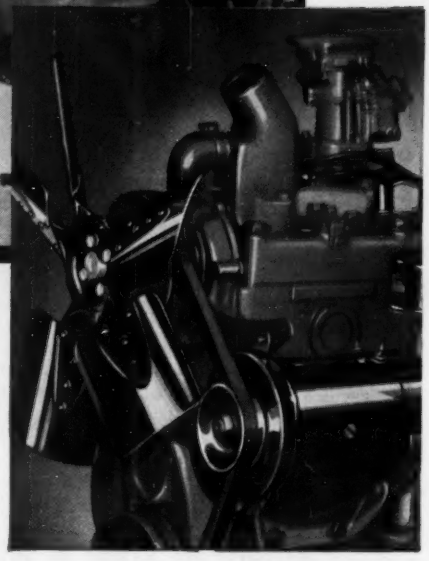
Columbia-Geneva Steel • Tennessee Coal & Iron • United States Steel Export Company, Distributors abroad





The finest equipment in construction and materials handling fields is powered by Chrysler.

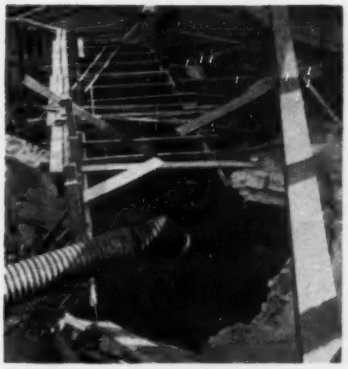
Send for 1958 Industrial Engine Catalog!

Address: *Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.*

Chrysler INDUSTRIAL ENGINES

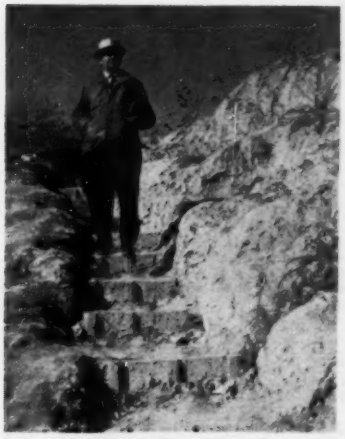
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

JOB TALK . . .
continued from page 22



Timber Trough Diverts Sewer

If you ever have to divert a large diameter sewer temporarily you can build a trough of wood 1x6-in. sheeting to any required width and height. Stud and wale it like you would a foundation form, then coat the inside faces and floor with asphalt. You'll have a serviceable diversion trough that is inexpensive to build and for the most part salvageable after it has served its purpose.



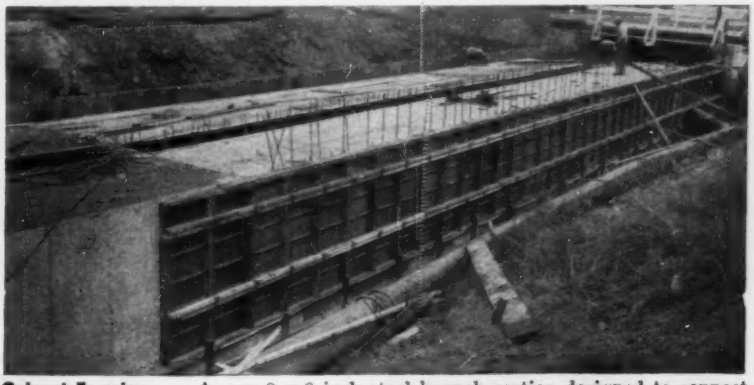
Some Inexpensive Job Stairs

On the addition to the House Office Building in Washington, D. C., Gunnell Construction Co. cut a series of steps through the excavation embankment at several different places to provide workmen with safe access to excavated areas. Pieces of wood sheeting reinforce the steps and protect them against collapse after heavy rains.

ROAD BUILDING with Symons Forms

Gang Forming . . . Symons wide panel forms made up in sections of 10′ x 24′ and 15′ x 24′ used to pour 2,400 foot long retaining wall.

Bridge Forming . . . By using Symons high strength forms, contractor was able to reduce pouring time, use fewer men and cut 100 days off bridge forming job.



Culvert Forming . . . A new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts.

Symons can help you with your forming problems. Our engineers will prepare complete form layouts and bill of materials at no obligation. Other Symons products used in road building are bar ties, tie chairs, column clamps and shores. Forms, shores and column clamps may be rented with purchase option—rentals to apply on purchase price. Information on Symons products and services sent FREE on request.

Symons CLAMP AND MFG. CO.

4255 Diversey Avenue **Dept. B-8** **Chicago 39, Illinois**

(Advertisement)

EXCLUSIVE CATERPILLAR "HI-ELECTRO" HARDENING MAKES STEEL TOUGH TO BREAK, HARD TO BEND

Result: New CAT Scraper and 'Dozer cutting edges, built to withstand increased demands of today's machines, are top buy.

The cutting edge of a bulldozer or scraper takes more punishment than any other part of the machine. And more punishment today than ever before. New, larger, more powerful machines make greater demands on cutting edges.

New Caterpillar cutting edges match the superb quality and performance of Caterpillar earthmoving equipment. They are built to stay on the most grueling jobs, day after day, without breaking or bending. There is no better buy at any price.

Field tests prove that the new Cat cutting edges not only outwear other make edges of the same thickness; they even outlast the thicker edges of other manufacturers.

To manufacture such tough edges, Caterpillar engineers perfected a hardening process to give steel the right blend of toughness and hardness—toughness to prevent breaking, hardness to prevent bending and rapid wear.

ROUGH JOBS like this put cutting edges to severe test. And here is where tough Caterpillar edges prove their superiority.

A quality edge starts with quality steel, tested in Caterpillar's laboratories for the right chemical composition and physical characteristics. Only steels meeting these exact specifications are accepted, and further tests are made at every stage of production.

Edges are heat treated by "Hi-Electro" hardening, a Caterpillar exclusive. This gives a deep, super-hard wear case. The core is left tough. The finished edge has an armor-like case and a shock-absorbing core.

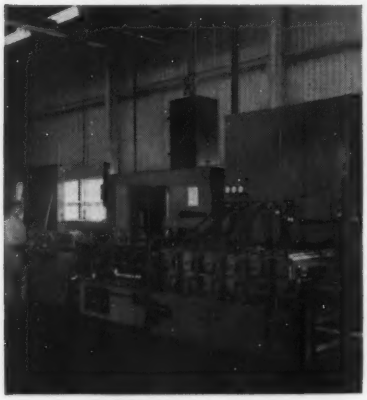
Your Caterpillar Dealer has full information about the new Cat Scraper and 'Dozer cutting edges. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

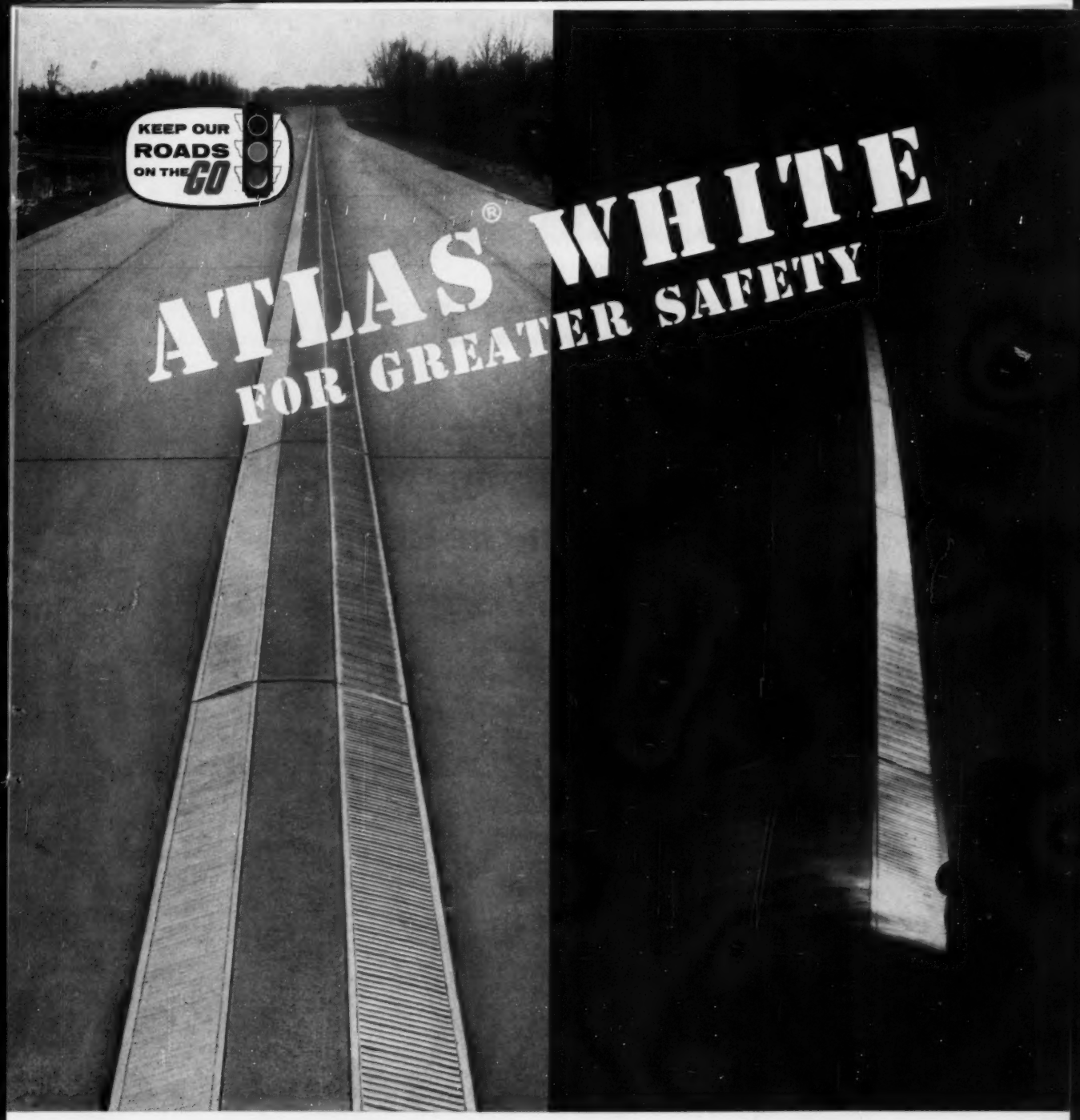
CROSS SECTION of edge showing armor-like case and its shock-absorbing core.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



"HI-ELECTRO" hardening machines at the Caterpillar factory give cutting edges the strength to resist breaking and bending.



- Reflecting concrete curbs made with ATLAS WHITE cement trace road's course well ahead of driver.
- In daylight, white curbing contrasts with highway pavement.
- At night, sawtooth surfaces reflect headlight rays back to driver. On rainy nights, the wet curb surfaces become even more reflective.

For more information on the contributions to highway safety made with ATLAS WHITE cement, write: Universal Atlas, 100 Park Avenue, New York 17, N. Y.

UNIVERSAL ATLAS CEMENTS

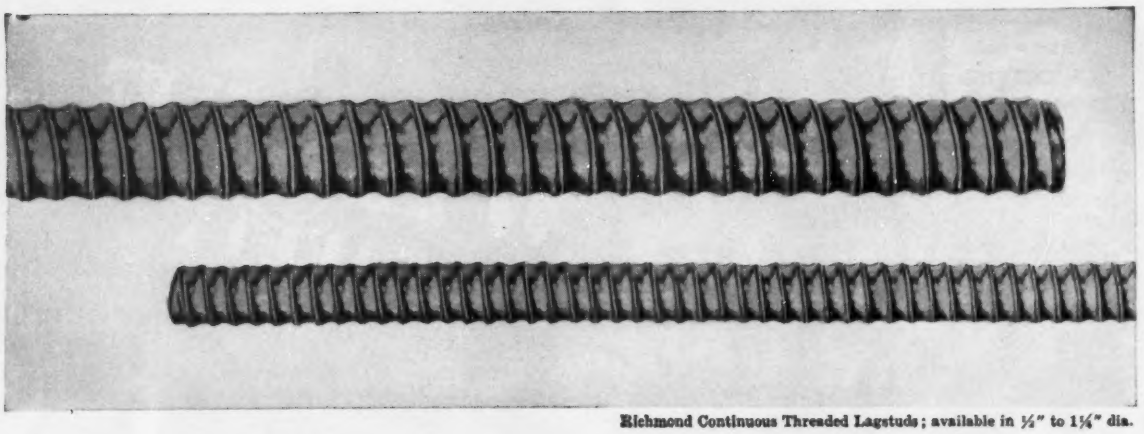
CB-86

USS

TRADE-MARK

UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

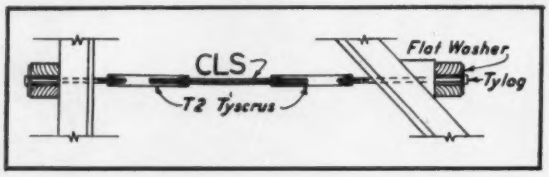


Richmond Continuous Threaded Lagstuds; available in ½" to 1¼" dia.

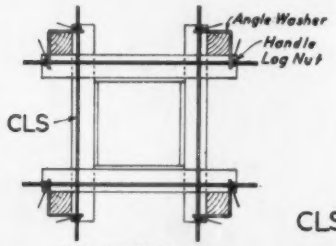
Concrete Form Tying Headaches Solved *on-the-spot* with Multi-Purpose Richmond Lagstuds

15% of concrete form tying work is "special"—hinging on conditions which develop as the job moves along. Before Richmond developed its Continuous Threaded Lagstud Rods, those special conditions were costly headaches. They always had meant lost man hours while "special" tys were built or "special" orders were filled.

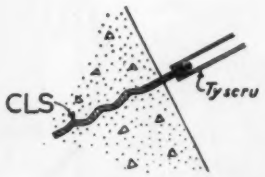
With a supply of Richmond's Continuous Threaded Lagstuds on hand, now any job foreman can have the needed sizes quickly cut to length on the spot. They come in ½-inch, ¾-inch, 1-inch and 1¼-inch diameters, threaded to fit the contour of the coil (helix) of the Tyscru; in 5-ft. and 10-ft. lengths.



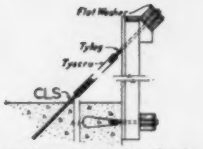
Lagstuds are among the most versatile members of the Richmond Tyscru family. Used alone, or in combination with other Tyscru products, they fill numerous other needs. Some of these uses are illustrated here.



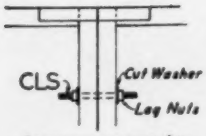
With Handle Lagnuts for exterior column or bulkhead tys



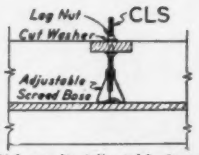
When furnished crimped, as anchorage to concrete where additional anchorage is needed in winter or below-strength concrete



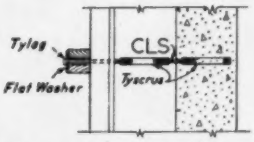
As anchorage for tying back forms to previous lift



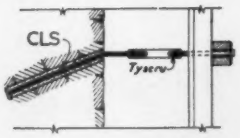
As emergency panel ty to hold two form panels together



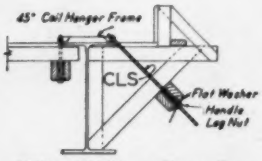
With Richmond's Adjustable Screed Base, to support a block form for a curb depression



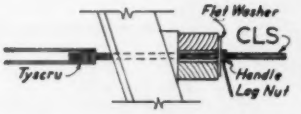
For tying together subsequent wall pours



Grouted into rock—as anchorage for wall-facing pours and brackets



With a 45° Hanger Frame-Ty on the fascia beam of a bridge



With Handle Lagnut and flat washer as an emergency Ty-lag substitute

The new Richmond Handbook describes the Richmond Adjustable Tyscru System and the entire Richmond line in detail. It is yours for the asking. To get it—or for help in solving a particular concreting problem—write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N.Y. or 315 So. Fourth St., Saint Joseph, Mo.

INSIST ON RICHMOND
... AND BE SURE IT'S RICHMOND!
Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVENUE · BROOKLYN 8, N.Y.
315 SOUTH FOURTH ST. · ST. JOSEPH, MO.

On Sewer and Water Line Jobs
Bucyrus-Eries Help You Make Money

Whatever your trenching conditions, you can profit from the extra output of a Bucyrus-Erie hoe. From the ground up, these machines are designed and built to put power to work moving dirt with top efficiency.

Your nearby Bucyrus-Erie distributor will be glad to explain how these machines can improve your profit picture. See him soon.

327E57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WIS.

15-B — *Trenching for new 12-in. sewer lines in Michigan, this ½-yd. 15-B hoe handled 20,000 cu. yds. of muck and wet soil for its owner, Union Construction, of Manchester.*

30-B — *This 1-yd. 30-B excavates for the installation of 36-in. concrete storm sewer pipe in a flood control project near Los Angeles, California. The machine is owned by the A B C Construction Co., Norwalk, Calif.*

22-B — *Trenching for a water main in Texas was made difficult by altitude, plenty of boulders, and considerable dust. But when this ¾-yd. 22-B was put on the job, work was completed quickly and economically. Foreman on the job reports the 22-B out-dug a new competitive hoe on the same job. Owner: El Paso Water Dept.*

38-B — *This 1½-yd. 38-B hoe excavated some 6,000 feet of trench for storm sewer installation in Ann Arbor, Michigan. The machine owner is Frank Siller, of Ann Arbor.*

Cutting costs is the primary function of portable conveyors

To make the greatest cost savings, portable conveyors must:

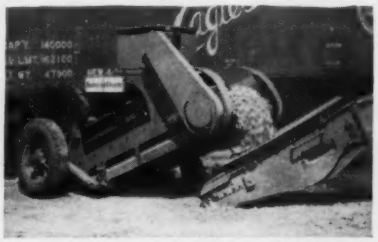
. . . have quality construction for long life and trouble-free operation. They must be available in the length and capacity range to suit your needs. They must be available with the features and accessories you want—screens, power hoists, pneumatic or steel wheels, gas or electric drives, etc.

They must be easy to move around the yard . . . easily towed from job to job. They must withstand constant use and frequent movement.

Shown above is the portable conveyor of advanced design, the Barber-Greene 363. Shaft and gear reducer drive—no chains—no sprockets, full swiveling wheels, Acme take-ups and many other exclusive features.

Shown below are other models in Barber-Greene's complete line of cost-cutting conveyors.

Model 374 cuts cost at high capacity. With capacities up to 425 t.p.h., this heavy-duty machine has antifriction bearings, shaft and gearbox drive, hydraulic boom hoist and other features.



Model 358 cuts cost of car unloading. Feeding a conveyor, this car unloader releases cranes and other expensive equipment for other work. Handles gravel, sand, stone, cinders, etc.

Model 362—low-cost, high-quality portable. Three-roll carriers, swivel wheel truck, and many other features not available on conveyors of this low-price range, are standard on the 362.

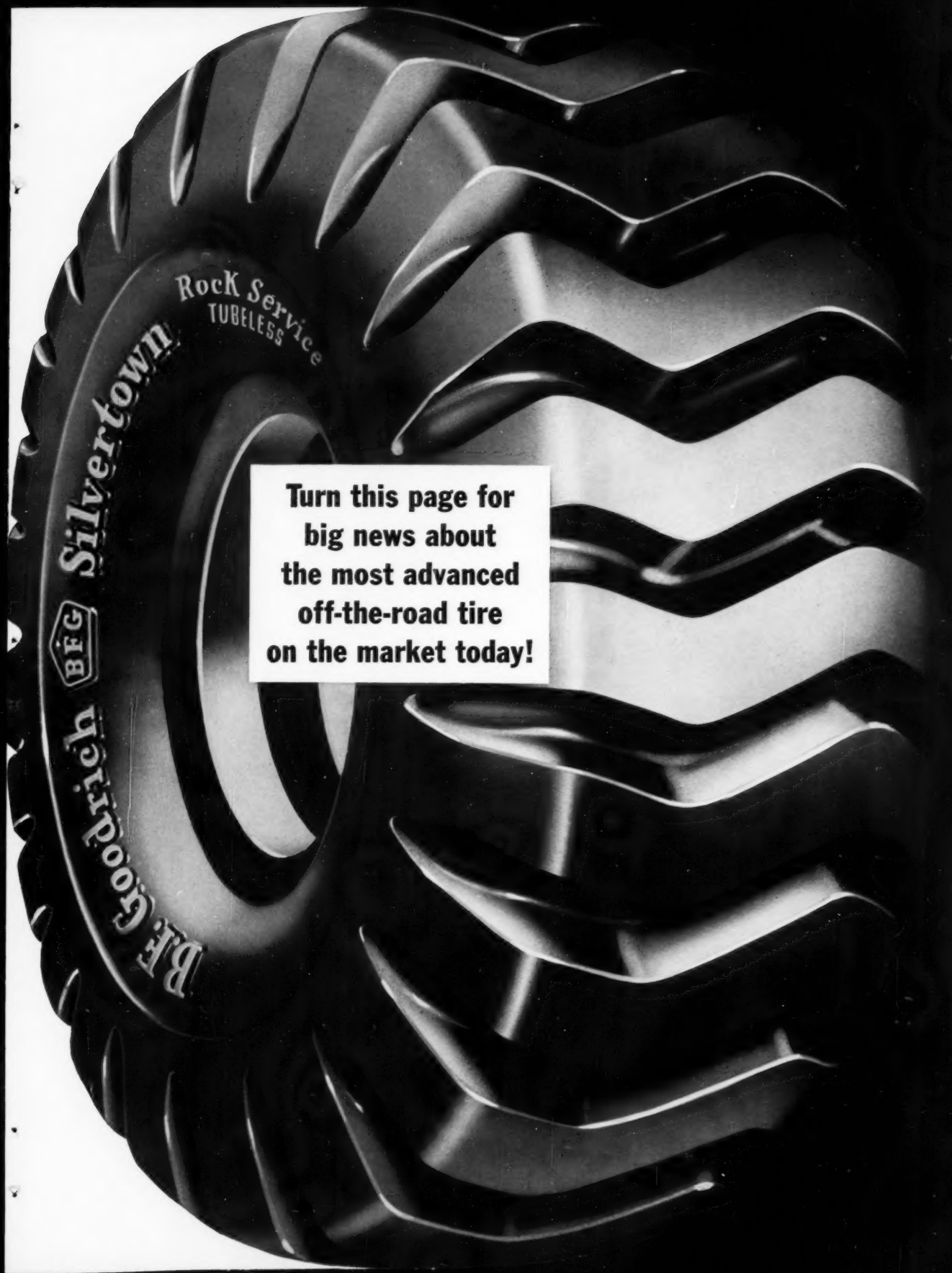
56-8-PO

Write for literature on any portable in the Barber-Greene line.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT


B.F.Goodrich
BFG
Silvertown
Rock Service
TUBELESS
Turn this page for
big news about
the most advanced
off-the-road tire
on the market today!

NEWEST, BIGGEST OFF-THE-ROAD TIRE FROM

B.F.Goodrich

NEW ROCK SERVICE TUBELESS PREVENTS UNNECESSARY TIRE FAILURES

THE new B.F.Goodrich Rock Service Tubeless tire for mining, quarrying and dirt-moving jobs eliminates the major cause of tire trouble and expense! Unlike ordinary tires, the Rock Service is *built to its inflated shape.* This FLEX-RITE construction permits *even* flexing. No localized stresses that often cause unnecessary tire failures.

The Rock Service is built with FLEX-RITE NYLON cords that withstand double the impact of ordinary cord materials, resist heat blowouts and flex breaks. Result: more retreadable Rock Service tires. Double-chevron cleats give maximum traction and skid resistance in forward or reverse. Sidewalls defy bruises, grooves expel stones.

B.F.Goodrich Tubeless construction runs cooler, protects against punctures, cuts maintenance costs, is easier to service.

See the Rock Service Tubeless (or tube-type)—the most advanced off-the-road tire on the market today—at your B.F.Goodrich dealer's. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

No unnecessary failures thanks to bruise-resistant tread and sidewalls, uniform flexing, cooler-running tubeless construction.

Greater traction—the double-chevron tread digs in and pulls in forward or reverse. Sharp cleat angles defy dangerous skids.

FLEX-RITE construction means the Rock Service is not distorted when inflated. No tire-killing stresses. Instead, uniform flexing.

More retreads, because FLEX-RITE NYLON cords withstand double the impact of other materials, resist heat blowouts, flex breaks.

Specify **B.F.Goodrich tires when ordering new equipment**

Smileage

Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

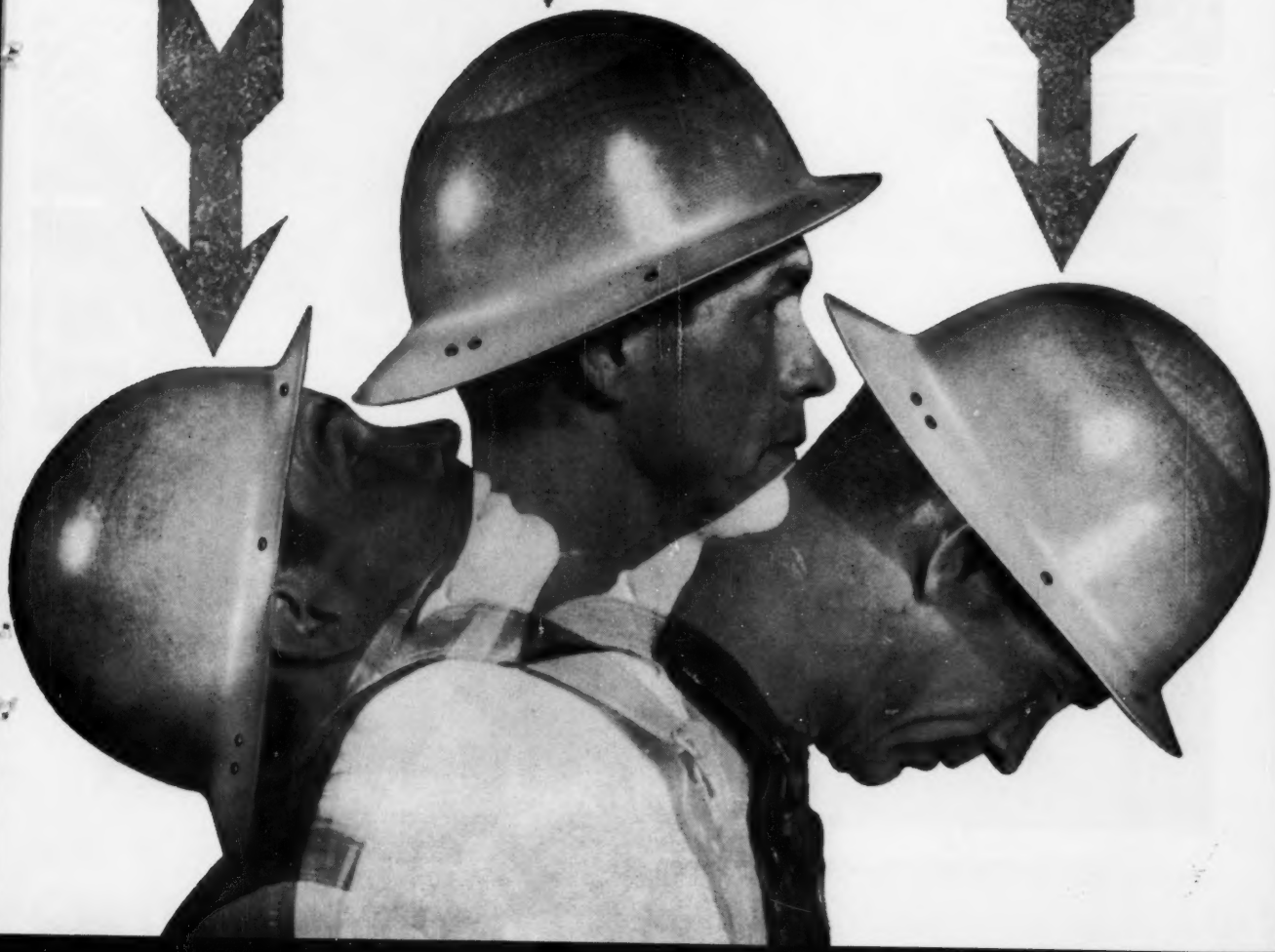
Reinforced protection where it's needed most—in the DANGER ZONE

This is an exclusive M-S-A® Skullgard feature. The dotted line around the Skullgard at right, bounds the *danger zone* . . . the front, top, and back areas of a hat that working positions expose most often to impact. Extra protection in this danger zone area, is the result of new high-pressure molding techniques, better materials, improved production methods. And, it's added protection without added weight. Get the facts on this important MSA development. Write us for further information.

MSA has prepared a unique visual aid to illustrate the principle of the Skullgard's reinforced protection. The MSA man will be glad to show you this series of 8 protective laminations.

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue
Pittsburgh 8, Pennsylvania

MSA
SAFETY EQUIPMENT HEADQUARTERS



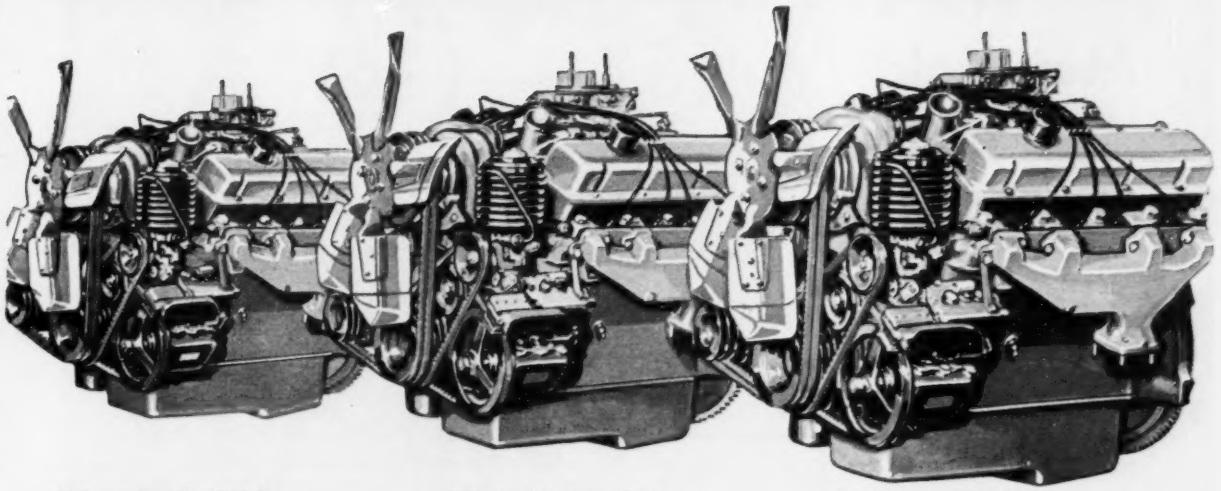
Big new FORD

Now...

NEW SUPER DUTY V-8 FEATURES

- Gross horsepower up to 277
- Gross torque up to 490 lbs-ft
- Modern Short Stroke design
- Three-stage cooling system
- Machined combustion chambers
- Sodium-cooled exhaust valves
- Stress-relieved blocks and heads
- Internally mounted oil cooler
- Water-jacketed intake manifold
- Submerged electric fuel pump

super duty V-8's up to 534 cu. inches!



401-cu. in. Ford V-8
Maximum horsepower—226.
Torque: 350 lbs-ft @ 1800 to 2300 rpm.

477-cu. in. Ford V-8
Maximum horsepower—260.
Torque: 430 lbs-ft @ 1800 to 2300 rpm.

534-cu. in. Ford V-8
Maximum horsepower—277.
Torque: 490 lbs-ft @ 1800 to 2300 rpm.

10 BIG NEW EXTRA-HEAVY TRUCK SERIES

GVW's up to 51,000 lb. For '58, ten new basic series are added to Ford's already extensive Heavy and Extra Heavy Duty line. Four new Tilt Cabs, four new Conventionals, and two new Tandem models offer GVW ratings up to 51,000 lb.

GCW's up to 75,000 lb. New T-950 Tandem is rated for 75,000-lb. GCW. Biggest single-rear-axle models are rated for 65,000-lb. GCW.

Front-axle capacities up to 15,000 lb. Choice of three front axles in most new Ford Extra Heavies. Rated capacities of 9,000, 11,000 and 15,000 lb.

Rear-axle capacities up to 29,000 lb. Wide choice of rear axles includes single-speed and two-speed, single reduction and double reduction types. Capacities range from 18,000 lb. to 29,000 lb.

Bogie-axle capacities up to 38,000 lb. For '58 there are *five* Ford basic tandem axle models. Biggest of the *five* is the brand-new T-950 which features a tandem rear-axle assembly rated for 38,000 lb. Other bogie-axle capacities range down to 22,000 lb. for Ford Series T-700.

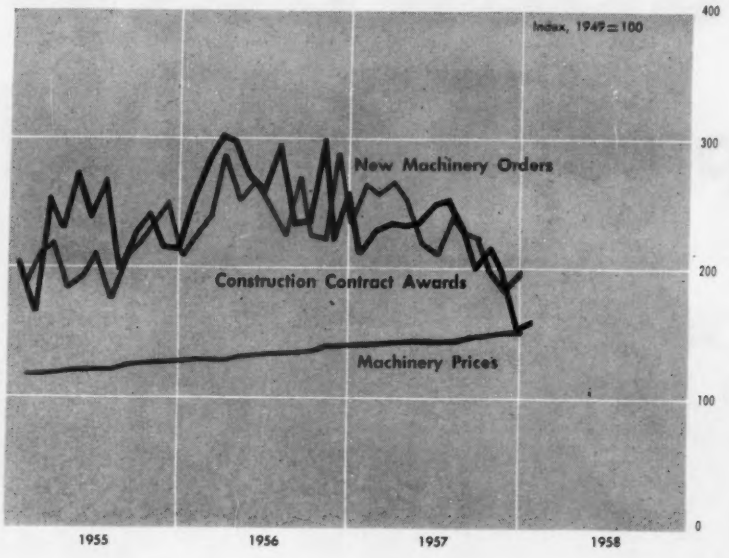
New transmissions. Roadranger transmission available in all ten new Ford Heavies. Up to 33% less shifting. Engines operate in peak horsepower range, use less fuel. "Short Fourth" transmissions also available on "F" and "C" Series.

FORD TRUCKS COST LESS

LESS TO OWN... LESS TO RUN... LAST LONGER, TOO!

Trends in the Machinery Market

Prices May Hold Steady During 1958



Price Index

	DEC 1957	MONTH AGO	YEAR AGO	PERCENT CHANGE 1956-57
All Types of Equipment	165.2	165.2	155.9	+ 6.0
Cranes, Draglines, Shovels	**163.0**	**163.0**	**156.2**	**+ 4.4**
Shovel, ½ cu yd	153.7	153.7	149.0	+ 3.2
Shovel, ¾ cu yd	167.4	167.4	158.9	+ 5.3
Shovel, 1-1½ cu yd	174.3	174.3	165.8	+ 5.1
Shovel, 2 cu yd	154.4	154.4	139.2	+10.9
Shovel, 3-3½ cu yd	162.7	162.7	154.1	+ 5.6
Shovel, 6 cu yd	179.5	179.5	170.9	+ 5.0
Crane, tractor mounted	135.1	135.1	120.3	+12.3
Crane, truck mounted	164.2	164.2	161.0	+ 2.0
Bucket, clam shell	152.7	152.7	144.4	+ 5.7
Bucket, dragline	180.8	180.8	180.8	0
Scrapers and Graders	**158.8**	**158.8**	**148.9**	**+ 6.6**
Scraper, 4 Wheel, 8-8.4 cu yd	155.0	155.0	145.2	+ 6.7
Scraper, 4 Wheel, 14.4-15.2 cu yd	151.3	151.3	140.6	+ 7.6
Scraper, 2 Wheel (a)	122.7	122.7	113.6	+ 8.0
Grader, heavy duty	164.0	164.0	154.1	+ 6.4
Grader, light & medium	161.2	161.2	152.2	+ 5.9
Tractors	**180.8**	**180.8**	**168.7**	**+ 7.2**
Wheel-type, off-highway (a)	127.7	127.7	118.6	+ 7.7
Crawler type, 37.0-45.1 dph	182.6	182.6	171.9	+ 6.2
60.5-75.0 dph	185.8	185.8	174.8	+ 6.3
102.0-116.0 dph	186.7	186.7	172.3	+ 8.4
126.0-155.0 dph	191.8	191.8	178.0	+ 7.8
Machinery, Tractor Mounted	**161.7**	**161.7**	**154.3**	**+ 4.8**
Dozer, cable control	151.6	151.6	149.0	+ 1.7
Dozer, hydraulic control	177.3	177.3	169.8	+ 4.4
Cable, power control unit	147.9	147.9	136.6	+ 8.3
Loader, shovel type	153.9	153.9	146.5	+ 5.1
Specialied Machinery	**149.3**	**149.3**	**141.0**	**+ 5.9**
Ditcher	154.1	154.1	147.1	+ 4.8
Roller, tandem	193.2	193.2	172.8	+11.8
Roller, 3 wheels	161.6	161.6	148.6	+ 8.7
Ripper and rooter	143.3	143.3	132.8	+ 7.9
Dewatering pump, 10 M gph	110.1	110.1	108.9	+ 1.1
Dewatering pump, 90 M gph	135.6	135.6	130.6	+ 3.8
Portable Air Compressors	**159.1**	**159.1**	**146.2**	**+ 8.8**
Contractors Air Tools	**164.3**	**164.3**	**150.0**	**+ 9.5**
Mixers, Pavers, Spreaders	**145.1**	**145.3**	**140.0**	**+ 3.6**
Mixer, portable, 6 cu ft	147.9	147.9	141.1	+ 4.8
Mixer, portable, 11 cu ft	155.4	155.4	150.0	+ 3.6
Mixer, portable, 16 cu ft	159.6	159.6	150.3	+ 6.2
Mixer, truck, 4½ cu ft	122.1	122.1	117.9	+ 3.6
Mixer, paving, 34 cu ft	174.6	174.6	166.8	+ 4.7
Concrete finisher	173.0	173.0	166.3	+ 4.0
Bituminous distributor	115.9	115.9	115.9	0
Bituminous spreader	160.3	160.3	149.9	+ 6.9
Bituminous paver	153.0	155.3	149.5	+ 2.3

a Index based on January, 1955 = 100
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

THE CONTRACTOR'S DOLLAR has stopped shrinking—in terms of the amount of new machinery it can buy. The upswing in machinery prices halted in December after a 4.8% rise during the five months between June 15 and November 15.

Manufacturers' prices on December 15, were exactly the same as they were a month previous, according to the U.S. Bureau of Labor Statistics index which held at its all-time high of 165.2 (based on average prices during 1947-49 as 100.)

During the 12 months ending last December 15, the BLS Construction Machinery Price Index increased by 6%. There were only scattered price hikes for some lines of machines in the first six months of the year.

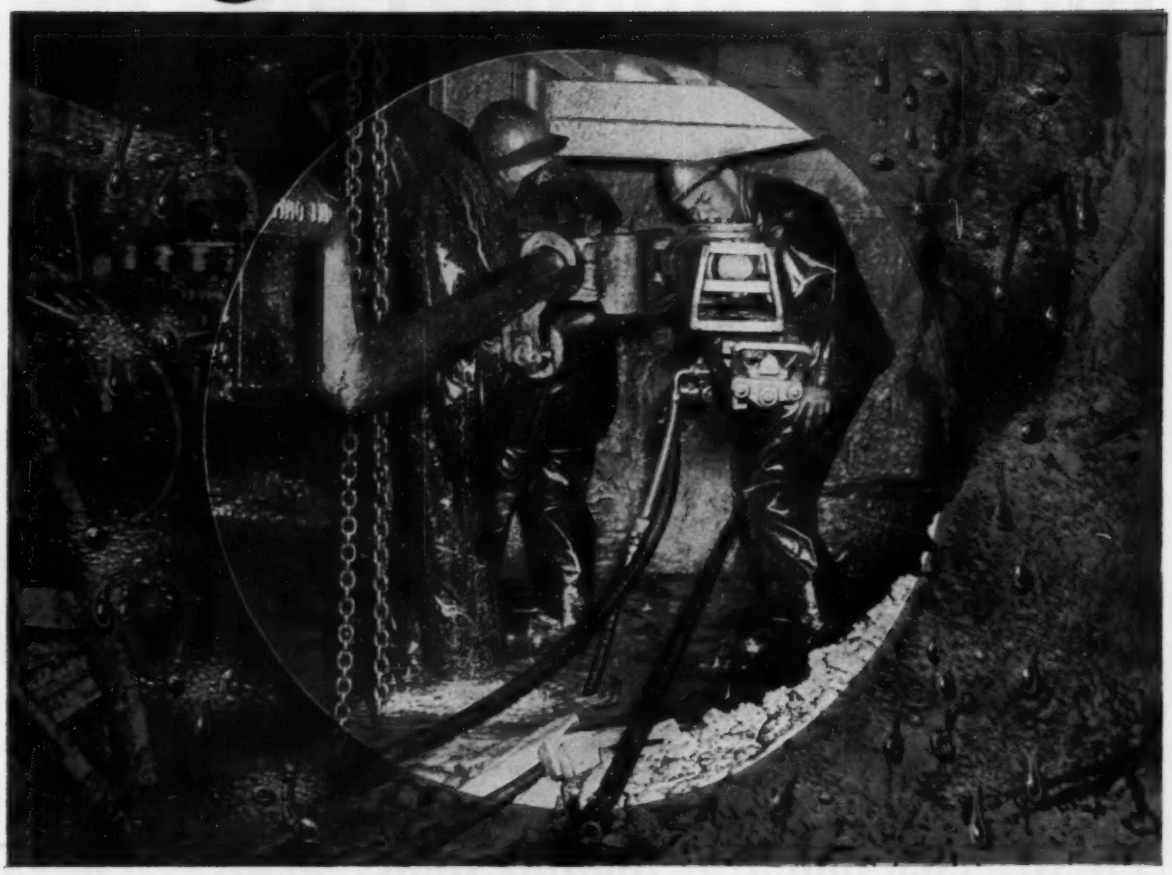
Prospects for 1958 indicate that while there may be scattered price increases after the steel price hike expected at mid-year, the machinery dollar's purchasing power will be relatively stable. An average rise of 1.5% to 2% on the outside is what contractors can expect in the way of price increases this year.

Machinery Makers Cut Output to Trim Stocks

Large inventories of machines at several plants around the nation point up the fact that manufacturers face a reduced and therefore more competitive market today than they enjoyed a year ago. Layoffs and shortened workweeks have been in effect at some plants for many weeks to cut down inventories and get production in line with the rate of incoming orders.

Trimmed inventories put manufacturers in a stronger position to avoid price concessions, but they also may weaken their ability to make fast deliveries if the construction contract trend turns upward substantially in the months ahead.

US RUBBER AIR HOSE



It's the Air that keeps things moving!

Deep under the Catskill mountains in Southern New York, thousands of feet of air hose snake along the wet, jagged rock passages of the West Delaware Tunnel project.

On this mammoth 160-million-dollar, 4-year construction job, everything below ground is run by compressed air (except, of course, the lighting). From muckers to exhaust fans, from suction pumps to jumbo drills, it's compressed air that *keeps things moving*. And every cubic foot of compressed air moves through U. S. Rubber Hose.

First, high-capacity U. S. Bull Line Hose carries the air to the working faces. Then, U. S. 4810 Air Hose moves the compressed air to the many types of equipment.

Because of their outstanding performance records U. S. Bull Line and U. S. 4810 Air Hose were selected by the several contractors involved. Both hose have covers of tough, pure-gum rubber to resist the severe abrasive conditions encountered. Both hose also feature neoprene tubes to combat action of oil in air lines. And between cover and tube, both Bull Line and 4810 have kink-resisting carcasses, each engineered for greatest hydrostatic values.

For all construction requirements, a complete line of rubber products—plus expert engineering assistance—is available at the 28 U. S. District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

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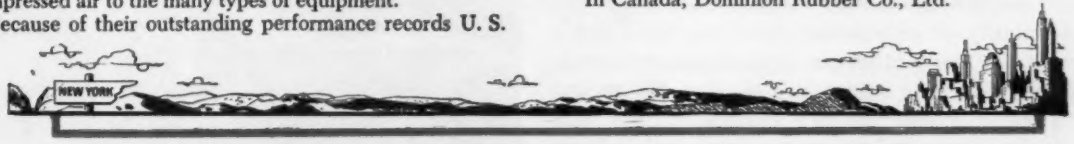
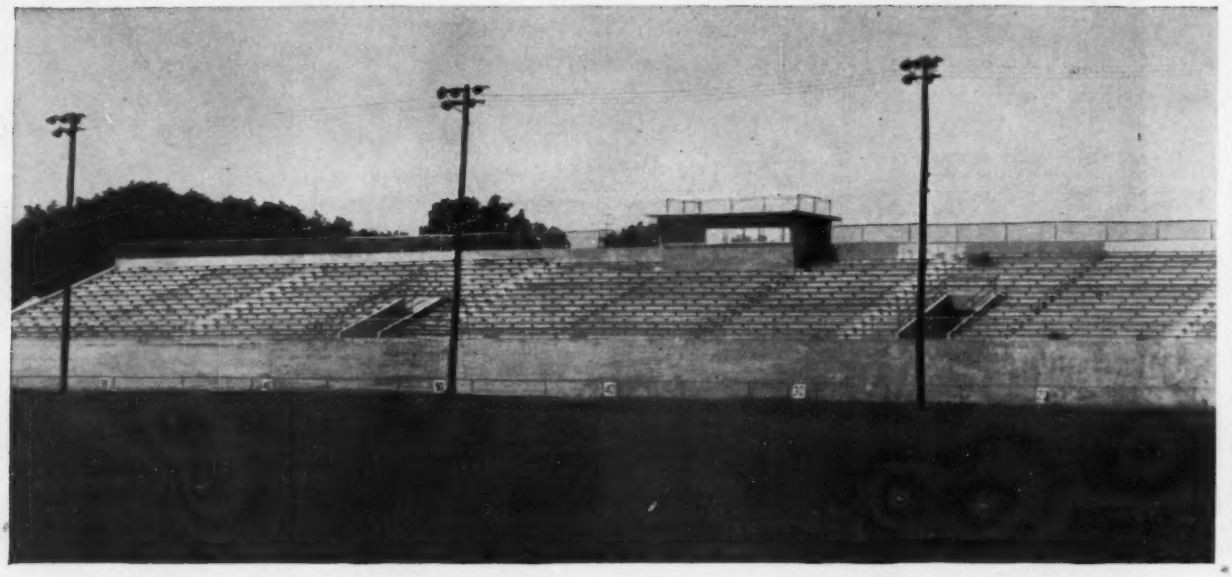


U. S. RUBBER PRODUCTS AT WORK ON THE 44-MILE WEST DELAWARE TUNNEL

US RUBBER Mechanical Goods Division **United States Rubber**

(Advertisement)

Getting Ready Fast for



Anderson Field Stadium in Fort Valley, Georgia. Manufacture and erection of this 2900-seat stadium was performed by Macon Prestressed Concrete Company, Macon, Ga. 7/16" Union Tufwire strand was used exclusively in the stadium slabs, which were erected in less than 5 days working time.

Owner of the structure is Peach County Board of Education, Ernest R. Anderson, superintendent.
Architects: Warren & Riley, Macon, Ga.
Structural Engineer: W. H. Armstrong, Macon, Ga.
General Contractor: Homer Davis, Ft. Valley, Ga.

Prestressed Concrete Seating Slabs Go Up In 5 Days

Ever watched a circus crew race against time to set up the seats before the ticket window opened? Concrete stadiums go up these days with comparable speed — thanks to prestressed concrete.

While the supporting stringers were being erected on the site, the Macon Prestressed Concrete Company cast and prestressed the special seating slabs for the Anderson Field Stadium, Ft. Valley, Ga. In just 5 days, the slabs were set in place ready to attach seats for 2900 sports fans.

This project is another demonstration of the adaptability of prestressed concrete. Here are a few of the many other prestressed concrete products in wide use: I beams, T purlins, tilt-up and tongue-and-groove siding; channel panels and slabs for floors and roofs; pipe and tanks; fence and lamp posts; highway and airport slabs; bridge and wharf piling; slabs, stringers and girders; complete warehouses, shopping centers, stadiums, gymnasiums, schools and commercial and industrial buildings. Experimental work of utmost promise is now under way on highway slabs.

Easy, fast transportability of prestressed structural members is a big advantage of prestressing. Here the stadium seating slabs are being hoisted from truck to position on the stadium stringers.

the Big Game

"The New Age of Concrete": What Will It Mean to You?

The construction industry has fielded a team that compares in speed with old methods like a 50-yard pass outstrips the slow advance of a ground attack.

The "team" is prestressed concrete construction. And speed is just one of the features that make it today's miracle building material, with a future unlimited.

Reporting on the recent progress in prestressed concrete, the Concrete Industries Year Book, 1957, says:

"In less than a mere half-dozen years prestressed concrete has grown from nothing to a building material which must be reckoned with in all construction in the future."

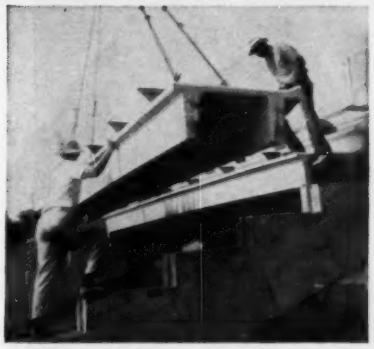
Here are some of the reasons why the industry has grown at rates of from 200% to 300% per year.

Prestressing increases tensile strength of concrete many fold. Less concrete and less steel are needed. Strength-to-weight ratio is high. Longer spans and thinner sections are possible. Prestressing combines the permanence of concrete with amazing flexibility and elimination of cracking. The savings it makes in time and money mean more profit for suppliers and constructors — greater value for owners and taxpayers.

Prestressing offers you big opportunities whether you use it as an on-site contractor with portable prestressing beds, or become a permanent site fabricator of concrete products of any description. And our own engineers will work closely with you or your consulting engineer on your stress-relieved wire and strand specifications.

Today Union Wire Rope Corporation is supplying the mounting demands for Tufwire high tensile wire and strand with on-schedule speed and dependability. And we're gearing to future needs — with technical know-how, expanding production facilities and research.

Get in touch with us now.



Savings in time and labor are pointed up by this view of slab being hoisted into place. No forms to build, no waiting on the weather nor materials in short supply.

Here is a close-up view of the completed stadium, erected in record time to add another laurel to the achievements of prestressed concrete. The strength and resilience of the prestressed seating slabs provides a high safety factor for the combination of load and vibration imposed by excited fans.

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Tallest 5′ x 7′ Safway Scaffold Saves 50% on Air Duct Installation

WORKERS GET AROUND FASTER AND SAFER ON 342-FT. TOWER

AIR CONDITIONING the 34-story Koppers Building in Pittsburgh, Pa., required cutting holes at 12 different heights in a blank masonry wall—50 ft. laterally from the nearest windows. Each opening was a two-day operation.

O. H. Martin Associates, general contractors, believed that only a swing scaffold could handle this job . . . despite the considerable time and hazards involved in getting to and from working locations.

To eliminate these problems, a 342-ft. built-up steel scaffold was engineered by the local Safway dealer. Many advantages resulted:

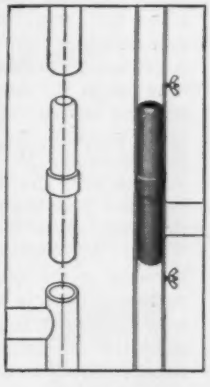
"Our cost for cutting the holes, including the Safway scaffolding, was less than 50% of that for a swing scaffold," testifies General Superintendent W. A. Kennedy. The final saving was even greater. Several holes required alterations in size and location, and the accessibility of the Safway steel scaffold made these changes simple.

SAFWAY LOAD CAPACITY DUE TO PRECISION FIT AND RIGID DESIGN

Although only 5 x 7 ft. in area from base to top, this Safway tower carried a load of about 3,000 lbs. per leg with complete safety. Such capacity results from the strong, rigid design and precision fit of Safway parts. The photo (*left*) shows how the assembled scaffold frames line up perfectly to form continuous 342-ft. tubular steel legs of unbroken accuracy.

Safway scaffold frames are joined vertically with simple "coupling pins" (*see diagram at right*). With a clearance maintained at just 1/32 in., these pins slide smoothly into tubular legs of the frames below and above . . . providing a snug fit that assures accuracy and rigidity in assembled scaffolds.

By minimizing "play" in individual couplings, Safway scaffolds reduce overall or cumulative error and thus can safely support heavy loads at great heights.



Ask for **ENGINEERING HELP AND FREE CATALOG**

Ask your experienced Safway dealer for scaffold planning and erection service. Ample stocks are available for sale or rental. And write direct to Safway for your copy of **BULLETIN 12.**

SAFWAY
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.

19 States Score Gains In 1957

DESPITE an overall 17% decline in 1957 heavy construction contracts reported by Construction Methods, 19 states and the District of Columbia topped their 1956 award totals. Increases ranged from a whopping 224% for Nevada to 4% for Minnesota.

Only three of the 10 biggest states scored gains in total contract volume, however: Illinois, Florida, and Connecticut. Illinois owes its 1957 increase largely to its toll road program which packed $250 million into its $1,156-million contract total for the year. By contrast, increased industrial building and private mass housing projects pushed Florida and Connecticut into the plus column in 1957.

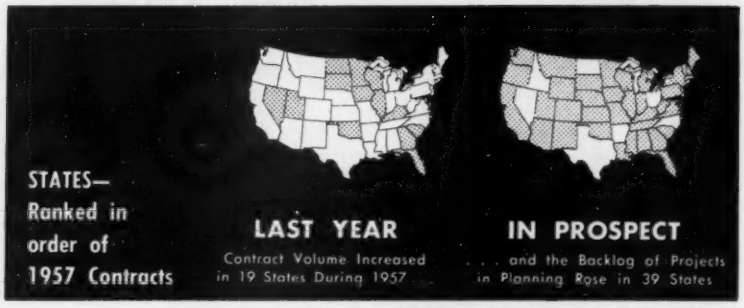
Nevada tripled its 1957 volume with a single project: the $107.9 million Glen Canyon Dam, biggest single contract ever awarded for a dam. On the other hand, Georgia doubled its heavy construction contracts in 1957 because of increased volume for several types of work.

Though only about one of three states scored contract award gains last year, many more increased their backlogs of heavy construction projects in the planning stage. No less than 40 states and the District of Columbia had more work in the planning stage on December 31, 1957, than the year before. The total U. S. backlog hit a new high of $111.5 million, 7% more than a year ago.

This $7.2-billion rise in the backlog is the best indication of future prospects for contractors' new business. It means that the potential of future contracts is bigger than ever. While there may be ups and downs, periods of rapid growth in contracts followed by periods of slow rise, so long as work being planned continues to rise contractors can count on increasing business.

continued on page 48

Heavy Construction Business By States



	1957 (Millions)	1956	Change '56-'57 %	Dec. 31 1957 (Millions)	Dec. 31 1956	Change '56-'57 %
U. S. TOTAL	$17,986	$21,712	−17	$111,482	$104,249	+7
NEW YORK	1,922	2,185	−12	10,822	9,834	+10
CALIFORNIA	1,721	1,990	−14	14,300	13,464	+6
TEXAS	1,326	2,194	−40	10,793	10,923	−1
OHIO	1,276	1,289	−1	5,773	5,972	−3
ILLINOIS	1,156	1,083	+7	5,659	5,247	+8
PENNSYLVANIA	985	1,296	−24	5,934	5,184	+14
MICHIGAN	827	1,132	−27	4,355	4,107	+6
NEW JERSEY	815	1,348	−40	4,713	4,020	+17
FLORIDA	529	421	+26	1,809	1,661	+9
CONNECTICUT	499	432	+16	2,458	2,115	+16
WASHINGTON	482	542	−11	5,262	4,766	+10
MASSACHUSETTS	480	490	−2	3,205	2,826	+13
INDIANA	398	864	−54	2,420	2,358	+3
MISSOURI	375	435	−14	2,227	2,135	+4
MARYLAND	373	550	−32	1,749	1,775	−1
LOUISIANA	354	336	+5	1,717	1,629	+5
MINNESOTA	278	267	+4	941	836	+13
WISCONSIN	275	256	+7	1,140	1,083	+5
IOWA	224	191	+17	1,038	983	+6
ALABAMA	222	333	−33	1,762	1,473	+20
OKLAHOMA	221	206	+7	1,463	1,374	+6
VIRGINIA	206	404	−49	1,483	1,457	+2
KENTUCKY	201	199	+1	1,050	942	+11
KANSAS	198	202	−2	1,055	1,038	+2
COLORADO	195	470	−58	1,600	1,488	+8
GEORGIA	177	88	+100	1,148	963	+19
OREGON	176	200	−12	1,081	980	+10
NORTH CAROLINA	144	150	−4	931	1,055	−12
UTAH	140	91	+54	751	611	+23
SOUTH CAROLINA	139	93	+49	861	843	+2
TENNESSEE	138	174	−21	1,473	1,359	+8
DIST. OF COLUMBIA	125	102	+22	900	835	+8
ARIZONA	124	183	−33	1,443	1,203	+20
NEBRASKA	123	151	−19	835	768	+9
DELAWARE	120	114	+5	351	357	−2
ARKANSAS	109	156	−30	1,218	1,260	−3
NORTH DAKOTA	103	82	+24	306	323	−6
NEW MEXICO	93	109	−15	722	537	+34
NEVADA	90	28	+224	247	247	−0.1
RHODE ISLAND	83	52	+58	438	409	+7
MISSISSIPPI	82	72	+14	706	637	+11
SOUTH DAKOTA	81	81	+1	227	219	+4
WYOMING	72	74	−3	484	402	+21
MONTANA	72	113	−36	584	570	+2
WEST VIRGINIA	66	285	−77	509	482	+6
IDAHO	59	61	−3	848	867	−2
MAINE	50	62	−20	333	283	+18
NEW HAMPSHIRE	49	50	−2	187	177	+6
VERMONT	31	22	+42	173	170	+2

Based on Contract Awards reported by CM and Proposed Heavy Construction reported by Construction Daily (McGraw-Hill).

Cone Bros. Contracting Co. is using the following Caterpillar-built equipment on this job: DW21-No. 470 LOWBOWL Scrapers; D9, D8 and D7 Tractors and a No. 12 Motor Grader. The DW21 units have a capacity of 25 cu. yd. heaped, 18 cu. yd. struck. Their LOWBOWL design pays off in high production at lower cost per yard.

"We have observed other machines and have come to the conclusion that our Caterpillar-built rigs have much less down time. We have found them more dependable. We're 100% Caterpillar on this job." **Charles E. Bailes, Jr., Superintendent of Cone Bros. Contracting Co., Tampa, Florida.**

Five DW21-No. 470 LOWBOWL Scrapers spearhead the Caterpillar line-up used by Cone Bros. on a 23-mile, $1,500,000 road building project in Florida. One section, running 12 miles from U. S. 41 at North Naples to Immokalee, involves moving about 500,000 cu. yd. of sand and marl. In extremely heavy going, the five DW21s hauled 120 loads in 10 hours over the two-mile round-trip. Each DW21 unit carried 21 cu. yd. per load. Here you see one of them being push-loaded by a D9.

CAT LOWBOWL Scrapers for lower cost per yard. As Superintendent Bailes observed, Caterpillar-built rigs "have much less down time" and "are more dependable." These are factors in high production. And in the case of Cat Scrapers, there's another big factor—exclusive LOWBOWL design. On job after job, matched against current models of other makes, Caterpillar LOWBOWL Scrapers have handled material at lower cost per yard. This is a fact, not a claim. It is completely documented by data covering road conditions, materials handled, load times, haul times, cycle times, bank yards per trip as well as the real payoff—cost of dirt moved per yard, the only true measure of a machine's productive capacity!

Your Caterpillar Dealer has proof. All these job facts are on file at your Caterpillar Dealer's. Have you seen them? They'll give you a good idea how Cat LOWBOWL Scrapers can lower your earthmoving costs. Your dealer will be glad to show them to you. He'll be glad to demonstrate, too—just say when and where, he'll be there!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Peoria, Ill.

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Loading broken concrete, Michigan heaps close to its 15,000 lb lift capacity.

TRACTOR SHOVEL CUTS EQUIPMENT INVESTMENT

How Arizona contractor used Michigan Model 175A as loader, dozer, shovel, backhoe and dragline

At the west outskirts of Globe, Arizona, where the Arizona State Highway Department has a three-mile section of U. S. 70 under reconstruction, Fisher Contracting Company of Phoenix had a lot of tough, costly jobs to do.

First, a long stretch of old concrete pavement had to be ripped loose and removed. Bridge footings had to be dug into solid sandstone. There were channel changes to make in adjoining streams. Digging even had to be done under high-tension lines strung on poles not too far above ground.

So widely diversified were these jobs that a contractor, thinking in traditional terms, would have assigned drilling equipment to the sunk-in-stone bridge footings . . . dozers and loaders to dirt removal . . . draglines, shovels or backhoes to other excavation. But the Fisher company is an alert outfit whose management recognizes that modern equipment often is highly versatile. They needed *only one machine* for all excavating and loading jobs . . . their Michigan Model 175A Tractor Shovel!

Breaks out 10 to 12-inch concrete

Its first assignment was loading out over a mile of the old pavement. In most places, the concrete was 40 ft wide *and 10 inches thick;* in some, past maintenance work had thickened the slab to 12 inches! A breaker ball, handled by a crane, got the first workout. Soon, Fisher's job supt wanted something faster. He tried one of his biggest tractors with a

(Advertisement)

rear-end ripper. This broke and loosened most of the old slab, but still left some sections needing breakout, and a lot of whopping big chunks requiring loading. Both breakout and loading proved "made to order" for the Michigan.

Loads 25 cu yds in 4 minutes

Later, the problem was complicated by need to load into two huge mining-type trucks with dump beds over 10 ft high. Here again the Michigan did a fine job. Of all loaders, it alone had the necessary *unobstructed* lift and reach. Its load time for each 25 cubic yard heap averaged only four minutes—and—according to Operator Dick Winans—was done "without working the operator to death". Fingertip controls placed close to the steering wheel made the Michigan "easy to operate even in this extremely hard digging".

Michigan digs out sandstone, saves blasting

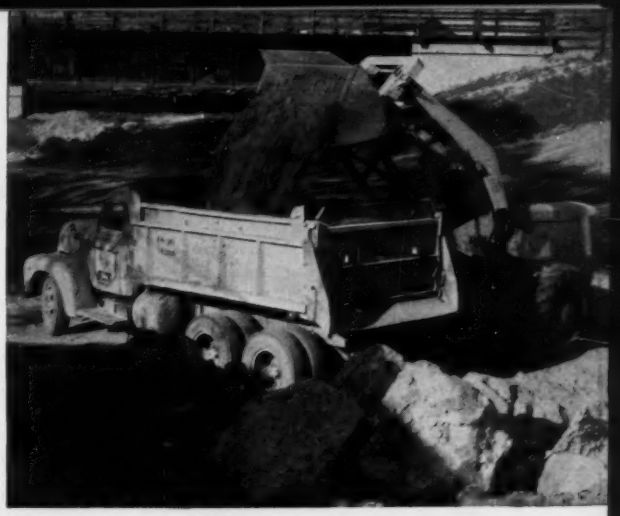
Occasionally, when pavement loading became caught up, the 24 mph Michigan ran over to where a reinforced-concrete bridge was called for in the plans. Here, it first removed overburden. Then, by working tooth-equipped bucket back and forth, it gouged out sandstone footings to required 3 ft depth. This digging method saved drilling and blasting at a location close to existing buildings.

Works in stream under low high-tension wires

Another big job done by the Michigan was to load 40,000 cubic yards in a channel change, deepening existing streambed above the new bridge. Here again, the Tractor Shovel was required to dig hard-bedded material . . . this time, stream-bed alluvium together with huge chunks of old piers which had been blasted loose. For shovel or dragline, loading would have been extremely tough because low hanging high-tension electric lines crisscrossed the area. Michigan, however, handled the job easily with clearance to spare.

Dozes haul roads, cleans cuts

In spare time, the machine even did some dozer work too . . . cleaning haul roads and dozing extra stream-bed alluvium out from under nearby bridges. Other times, it did miscellaneous lifting, plus assisting truck drivers erect and dismantle tailgates. "Great work-ability, plus *day-after-day dependability,* made the Model 175A one of the most important pieces of equipment on our project," said one company official. "It played a *major role* in bringing the project to completion *ahead of schedule!*"



Clean bucket-arm design preserves dumping clearance.

Deepening existing river bed, Michigan works easily in tight quarters under bridge and power lines.

Hardbed alluvium yields to the powerful 133 hp Michigan.

Michigan is a registered trade-mark of
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KRETE-KUT outperforms all others in highway sawing test

Bay State Krete-Kut reinforced blade cuts green concrete to 2" depth on Dallas-Fort Worth Turnpike. Standard 14" blade cuts 1" to 4" deep . . . available in four thicknesses to cover all width-of-cut requirements.

Before regular sawing began on the Flenniken-Lacy sections of the new Dallas-Fort Worth Turnpike, blades made by practically every manufacturer were tested. Manufacturer's representatives were on hand to observe the test.

RESULT: Bay State's Krete-Kut reinforced blade outperformed all others and was ordered in quantity for the whole job.

Actual cost records show that Bay State blades average 1½¢ to 6¢ in costs per inch foot depending on aggregate used...and Bay State blades efficiently cut *all* types of aggregate in green concrete. They also survive undamaged if water supply stops momentarily.

Your Bay State representative is ready to demonstrate anytime.

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CONSTRUCTION BUSINESS . . . continued from page 44

Highway & Bridge Contracts Rise in 33 States

Two-Thirds of States Step Up Highway Awards

Thirty-three states and the District of Columbia awarded more highway and bridge construction contracts in 1957 than the year before. These states were responsible for pushing the U.S. total 21% above 1956's previous high to a record $3,737 million. This includes jobs let by state highway departments, toll road and toll bridge agencies, plus county and municipal projects.

Top state was Illinois with $456 million, including $250 million for toll road construction. Other leading states were New York, California, Texas, Pennsylvania, Ohio, Michigan, and Iowa.

Interstate highway contracts accounted for $1,075 million, less than one-third of contractors' new highway and bridge business last year. Top states were New York, Ohio, California, Texas, Pennsylvania, and Illinois.

"ABC" or "50-50" federal-aid highways totaled $1,350 million, 2% under 1956.

For projects other than federal-aid and toll roads, state highway departments let $550 million worth of contracts during 1957. This was off 9% from 1956 but still at a high level.

Highway & Bridge Contracts Rise 21%

As reported by Construction Methods* (in thousands of dollars)

Region and State	1957	1956	Per Cent Change
United States Total	**$3,736,550**	**$3,086,164**	**+ 21**
New England	**210,644**	**339,646**	**– 38**
Maine	16,296	16,381	– ½
New Hampshire	16,581	19,880	– 16
Vermont	9,825	7,159	+ 37
Massachusetts	61,814	84,913	– 27
Rhode Island	15,536	12,439	+ 25
Connecticut	90,592	198,874	– 54
Middle Atlantic	**725,349**	**463,045**	**+ 57**
New York	377,224	222,321	+ 70
New Jersey	46,347	39,293	+ 18
Pennsylvania	222,540	123,209	+ 81
Maryland	50,278	55,534	– 9
Dist. of Columbia	13,540	9,739	+ 39
Delaware	15,420	12,949	+ 19
South	**593,664**	**504,383**	**+ 18**
Virginia	81,275	71,117	+ 14
West Virginia	22,379	16,398	+ 36
North Carolina	68,510	46,074	+ 49
South Carolina	32,682	27,436	+ 19
Georgia	48,897	34,088	+ 43
Florida	93,749	93,793	0

continued on page 52

This 25-ton truck crane travels without permit

New Michigan strips to 41,500 lbs. gvw

1 **Every truck crane user** has the problem of meeting highway weight limits, whether he drives over superhighways, or country roads.

2 **To prepare *this* crane** (a *new* MICHIGAN Model T-24) for weighing, all that had to be done was remove counterweight and rear outrigger under power, then un-pin boom.

3 **Rear tandem axle weighs** in at 32,000 lbs. . . . front axle, 9,500 lbs. Total gross, 41,500 lbs., is well within highway weight limits.

4 **After noting overall width** of under 8 feet, the "go" signal is flashed (left) and the MICHIGAN Model T-24 truck crane moves off the scale and is on its way without delay.

Michigan is a registered trade mark of

CLARK® EQUIPMENT

Write for details on performance, price and delivery

CLARK EQUIPMENT COMPANY, Construction Machinery Division
2403 PIPESTONE ROAD, BENTON HARBOR 37, MICHIGAN

How to Install Rock Anchor Bolts

These are the four easy steps when you install the Bethlehem wedge-type rock anchor bolt. The 1-in. diam slotted bolt locks itself into the rock formation, anchoring the rock layers so tightly that it is virtually impossible for serious rock slides to endanger traffic.

In addition to the wedge-type bolt, Bethlehem also makes a ¾-in. diam headed anchor bolt, used with an expansion shell. Both bolts are easy to install, and provide positive locking action.

If you would like to know more about the use of Bethlehem anchor bolts in minimizing danger from rock slides, our engineering staff is at your service. Just drop a line to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

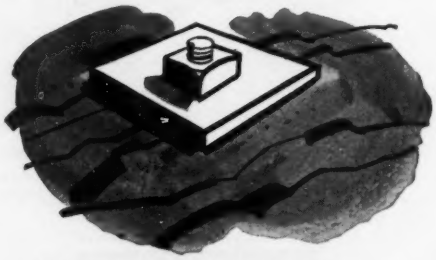
BETHLEHEM STEEL

BETHLEHEM STEEL

1 Wedge is inserted in slotted end of anchor bolt. The 1¼-in. hole has been drilled previously, to depth 3 in. less than length of bolt.

2 Bolt is inserted through opening in steel anchor plate (rock anchor tie and plate may be used instead), then placed in the hole.

3 Bolt can be driven by same equipment used in boring hole. Dolly protects threads. Wedge drives deep into bolt, spreading slotted portion. Impact wrench is used in tightening nut.



4 With the nut drawn up tightly, the steel anchor plate bears against the rock surface, providing additional support.

"At least one dozer in five should be on rubber!"

says Villa Contracting Company, Westfield, N. J., owners of this Michigan

When Villa Contracting Company decided to update their rubber-tire dozer fleet recently, their choice was the 165 hp Michigan Tractor Dozer.

"We very much liked Michigan's simple, dependable hydraulic control system," explains Partner George Villa . . . "its trouble-free oil-sealed clutches . . . and the fine service record of our Michigan Tractor *Shovels*. Tests on the job showed us the Michigan *Dozer* would do as much work as *any* rubber-tire dozer . . . and its price was about $6,500 less than other big units. *So we bought it!*"

Saves $150 per move

Michigan is really fast on the job, according to Milford Redman, Villa's General Superintendent. "Spreading fill, for example, it does the job *20% to 50% faster* than big track-type dozers," he says. "Between jobs, the Michigan is a lot faster, too. To move crawlers we have to call for a trailer—and it can take half a day to get one from the shop. We figure *each* move costs up to $150—and on a widening job we might have to move dozers *five times a week*. Our Michigan can travel the couple of miles required in ten minutes *under its own power*. Its cost, including operator's wages: about two bucks."

"A Michigan pays off on every job"—owner

"We feel it pays to have at least one such rubber-tire dozer *on every job*," says George Villa. "My guess is, the average road-building contractor should have one for every four or five crawler-type dozers. Of course, if your work is in sand you can easily use *more* rubber-tire machines —in city or sewer work, a *lot more*."

"Works faster and better"—operator

"I like the way all controls are at my fingertips," reports Operator Al Therrien, veteran of six years on graders, dozers, pans, etc. "Our Model 180 carries the grade easily. The blade floats in neutral position, and it's easy to backblade and clean up as I go along." Traveling between assignments, Al reports he stays right up with traffic. "And the Michigan is under perfect control always," he says. "Power steering and power brakes make driving it a cinch!"

Let their experience be your guide

Villa Contracting Company asked for a demonstration from their local distributor, Equipment Distributors, Inc. They saw what the Michigan Tractor Dozer could do . . . and, they *bought* the obvious savings in time and money. Why don't *you* do the same? Your local Distributor will be glad to arrange a test—*you* pick the job. And ask him about the wide variety of purchase plans available . . . including Clark's no-money-down, pay-as-you-profit lease-purchase plan. With it, you can put one or more Michigans to work without laying out a penny of capital!

Michigan is a registered trademark of

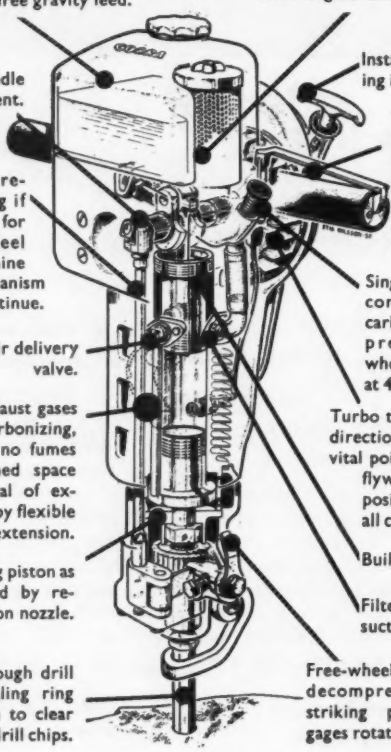
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road,
Benton Harbor 34, Michigan
In Canada: Canadian Clark, Ltd.,
St. Thomas, Ontario

CLARK® EQUIPMENT

NEW COBRA

WORLD'S LIGHTEST MOTOR DRILL

After extensive field testing the new 100% self-contained motor drill/breaker from Atlas Copco is on the market. The COBRA is a versatile, portable tool weighing only 53 lbs, drilling to 13 ft at 26 ft per hour. The COBRA can be used at high altitudes up to 11,000 ft, and is specially designed for easy carrying. It is quickly converted to light breaker, and embodies all the outstanding features shown below, which make it the most up-to-date machine of its kind and one that has already proved its worth in many parts of the globe.


Non-return air inlet insures leakproof fuel tank. Constant fuel supply from trouble free gravity feed.
Air filter supplies clean air to both engine and compressor.
Seven point needle bearing movement.
Instant pull-type starting in any climate.
Rotation mechanism incorporates unique torsion bar which prevents engine stalling if drill steel jams. Makes for easier release of steel when freeing the machine because striking mechanism and rotation force continue.
Top throttle control gives full power in working position and returns to idling automatically when hand pressure released.
Single action mixture control and floatless carburettor ensure foolproof running even when operated upwards at 45°.
Filtered compressed air delivery valve.
No use is made of exhaust gases which means—no decarbonizing, no clogged channels, no fumes when used in confined space because 100% removal of exhaust gases is possible by flexible extension.
Turbo type fan gives forced directional air cooling to all vital points. Rugged built-in flywheel magneto gives positive ignition under all conditions.
Built-in air compressor.
Filtered air lifts striking piston as pressure is maintained by reduction nozzle.
Filtered air through suction valve.
Clean flushing air through drill steel. Non-escape sealing ring gives correct pressure to clear hole of drill chips.
Free-wheeling lever (simple decompression immobilises striking piston—also disengages rotation mechanism).

See the Cobra in action. Write or phone for further information.
Sales and service depots from coast to coast

Atlas Copco

ATLAS COPCO EASTERN INC., P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310

ATLAS COPCO CANADA LTD., Montreal Airport, Quebec. Phone Melrose 1-5571

ATLAS COPCO PACIFIC INC., 930 Brittan Ave., San Carlos, Calif. Phone Lytel 1-0375

ATLAS COPCO MEXICANA S.A., Apartado Postal 56, Torreón, Coahuila. Phone 39-07

DST/66

CONSTRUCTION BUSINESS . . .

continued from page 48

Highway and Bridge Contracts Rise 21% . . . continued

South			
Alabama	35,606	43,177	– 18
Mississippi ..	49,223	16,243	+203
Louisiana	56,787	85,124	– 33
Kentucky	45,389	28,578	+ 59
Tennessee....	59,167	42,355	+ 40
Middle West ..	**890,017**	**581,436**	**+ 53**
Ohio	196,574	165,110	+ 19
Indiana	38,002	32,209	+ 18
Illinois	455,810	178,715	+155
Wisconsin ..	58,939	68,287	– 14
Michigan ..	140,692	137,115	+ 3
West of			
Mississippi ..	**873,494**	**782,867**	**+ 12**
Minnesota ..	56,727	78,075	– 27
Iowa	105,053	79,193	+ 33
Missouri	81,595	58,097	+ 40
Arkansas	20,761	29,059	– 29
North Dakota	32,682	24,987	+ 31
South Dakota	24,367	27,641	– 12
Nebraska ..	31,322	25,438	+ 23
Kansas	55,353	48,357	+ 14
Oklahoma ..	62,437	59,459	+ 5
Texas	245,256	232,403	+ 6
Montana	25,346	32,983	– 23
Wyoming ..	33,330	19,598	+ 70
Colorado	57,760	41,181	+ 40
New Mexico	41,505	26,396	+ 57
**Far West ..... **	**443,382**	**414,787**	**+ 7**
Idaho	18,421	19,161	– 4
Utah	16,708	12,445	+ 34
Arizona	23,004	24,180	– 5
Nevada	13,810	12,911	+ 7
Washington	75,810	60,814	+ 25
Oregon	46,209	45,624	+ 1
California ..	249,420	239,646	+ 4

*These contracts include projects costing $73,000 or more.

SOME BIG CONTRACT AWARDS OF THE MONTH

Merritt, Chapman & Scott Corp., 261 Madison Ave., New York, N.Y. Main power plant, Niagara Project, Lewiston near Niagara Falls, N.Y. The Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York. $98,288,498.

M. W. Kellogg Co., 225 Broadway, New York, N.Y. A 16,500-ton electrolytic copper refinery, near Baltimore, Md. for Kennecutt Copper Corp., 161 E. 42nd St., New York. $31,000,000.

Turner Constr. Co., 150 E. 42 St., New York 17, N.Y. Hilton Hotel, Pittsburgh, Pa. Hilton Hotels Corp., 401 7th Ave., New York. N.Y. $14,000,000.

MODEL M-G Small, for light construction. 29″ dia. Combination floating-finishing trowels. Gas. (M-E, Elec.)

MODEL JA-G Medium machine for general use. 34″ dia. Float trowels snap on. Largest selling model. Gas.

MODEL JA-E One of the four electric models 34″ dia. For average size jobs. Snap-on trowels for floating.

MODEL JA-4G For average jobs. Four trowel design. 34″ dia. Combination trowels. Fixed ring. Gas. (JA-4E, Elec.)

CHECK

the

Whiteman

FINISHER

that's best for you!

MODEL BA-G For finishing large areas. 44″ dia. Snap-on trowels for floating. Gas. (BA-E, Electric.)

MODEL SF-A Disc float, for patented method floors. 24″ cast iron disc. (SC-A convertible to floating-finishing)

No matter how much or how little concrete finishing you do, there's a Whiteman Finisher that's perfect for your needs. Each of the 13 models incorporate exclusive Whiteman features and rugged construction, the results of 18 years of sound engineering and quality manufacturing. And each is designed to do the job faster, better and cheaper—to save time and money—to increase profits for you. Call your Whiteman distributor for details today!

More Whiteman Finishers are in use than <u>all</u> other makes combined!

MODEL CA-4G Big, heavy-duty machine for large areas. 46″ dia. 4 combination trowels. Fixed ring. (C-42, 42″ dia.)

MODEL TW Twin, for extra-large areas. Finishes 5′ width. Does work of two machines. No torque. Comb. trowels.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

IT'S YOUR MOVE!

WHITEMAN MANUFACTURING CO. Dept. C
13820 Pierce St., Pacoima, Calif.

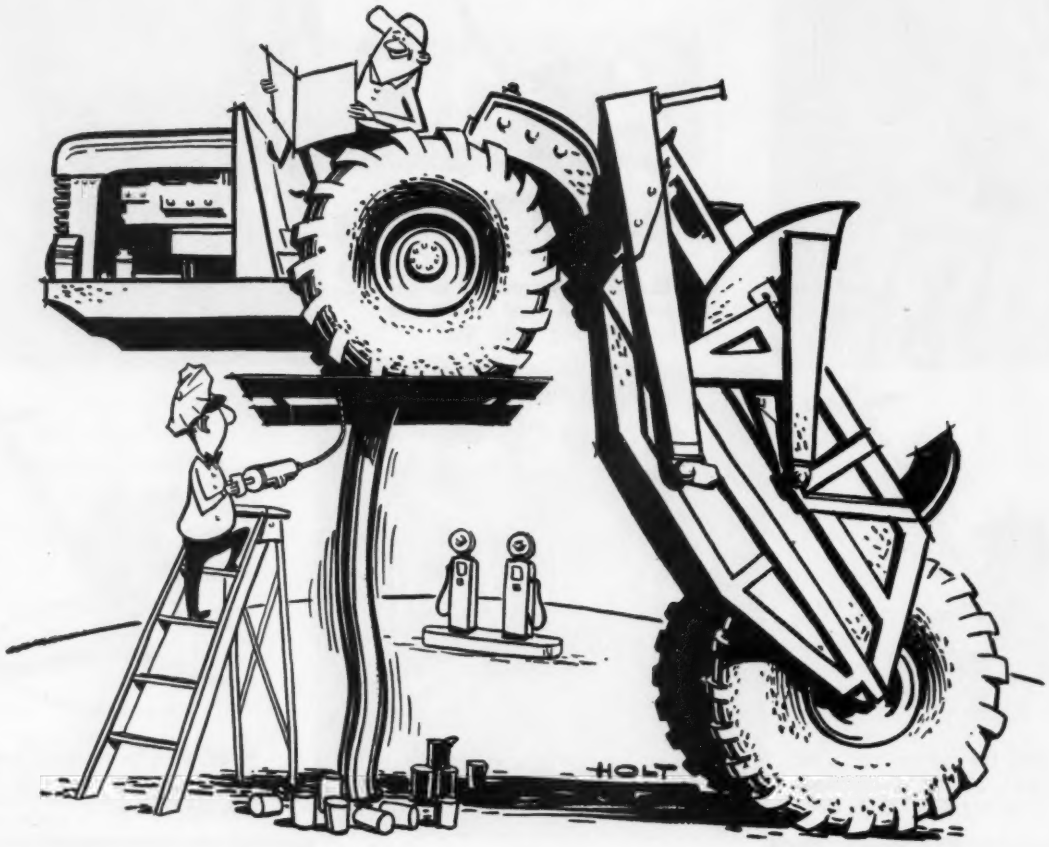
Please send prices, catalogs and name of distributor for
☐ Power Buggies ☐ Screeding Machines ☐ Vibrators
☐ Floating-Finishing Machines ☐ Truck Mixers.

Name.....

Firm.....

Address.....

City.....Zone.....State.....



Why use automobile grease in heavy-duty equipment?

Let's not kid ourselves about the difference between the lubrication requirements of automobiles and heavy-duty machinery. D-A Lubricants are compounded specifically for heavy-duty equipment. There is a right one for every application.

For example, D-A Track Roller Lubricant • D-A Type AC Track Roller Lubricant • D-A Winter Track Roller Lubricant • D-A Open Gear • D-A Torque Fluid • D-A Lithium, Extra-Heavy.

Let your D-A Representative give you all the facts on how D-A Lubricants can reduce parts wear and minimize downtime . . . *increase the return on your equipment investment.*

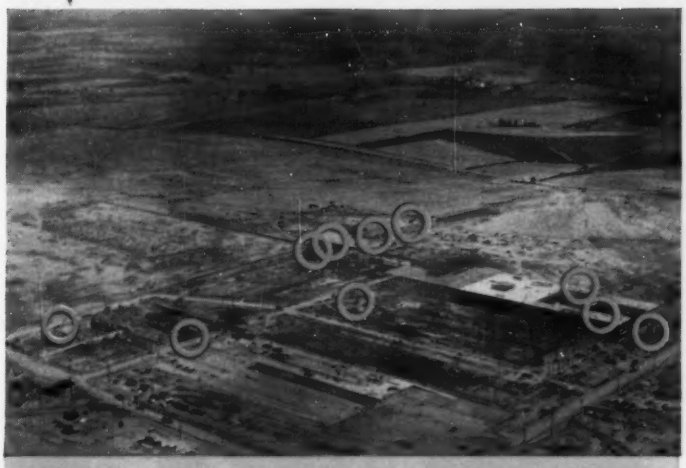
D-A Lubricants make equipment last longer

D-A LUBRICANT COMPANY, INC. • Indianapolis 23, Indiana

machines. No torque. Comb. trowels.

"Fleet Owner" reports

How 11 BANTAMS speed work on huge industrial plant



11 BANTAMS (located by colored circles) demonstrate their versatility by taking over all kinds of assignments to help rush this huge new Western Electric plant to completion in Omaha, Neb. Work is subcontracted as it comes up. Supervising contractor is Peter Kiewit.

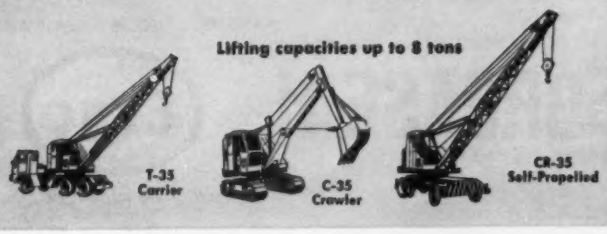
1. Setting sewer pipe under steel work. BANTAM is the only rig on the job capable of doing this inside work due to low clearance and weight of pipe.

2. More earning power . . . tamping backfill around building foundations with a BANTAM.

3. Digging ditches up to 18' deep after preliminary channel has been stripped by dragline. BANTAM shown using 42" back hoe bucket.

4. Excavating for storm and sanitary sewer lines, water lines and electric lines, BANTAM handles buckets up to 42" wide.

Lifting capacities up to 8 tons



"I'm continually amazed at the work a BANTAM can do!"—says K. R. Weikhorst, Omaha contractor (who owns 12 BANTAMS)

Here's a man who got into business—big business—with a BANTAM!

Only 7 years ago K. R. Weikhorst was employed as a shovel operator. Then he decided to go into business for himself. Having experience with many makes and sizes of excavators, he chose BANTAM—got together a small down payment and bought his first one.

Since then he has bought more than 20 BANTAMS. Eleven of them are busy on the construction of this new $25,000,000 plant with more than 40 acres under roof. The BANTAMS dig sewer and water lines, excavate for footings, tamp backfill, set steel, handle bulk materials, etc.

Averages $100-per-day income per BANTAM

Even after 7 years' experience with more than 20 BANTAMS, Weikhorst is still enthusiastic about the work capacity and versatility of the BANTAM. At a $12.50-per-hour rate he averages $100 per 8-hour day with each BANTAM.

Yearly maintenance costs under $50

He can also tell you about the way BANTAMS stay on the job and ask very little in return. "Our BANTAMS cost us less than $50 apiece per year for maintenance," says Mr. Weikhorst.

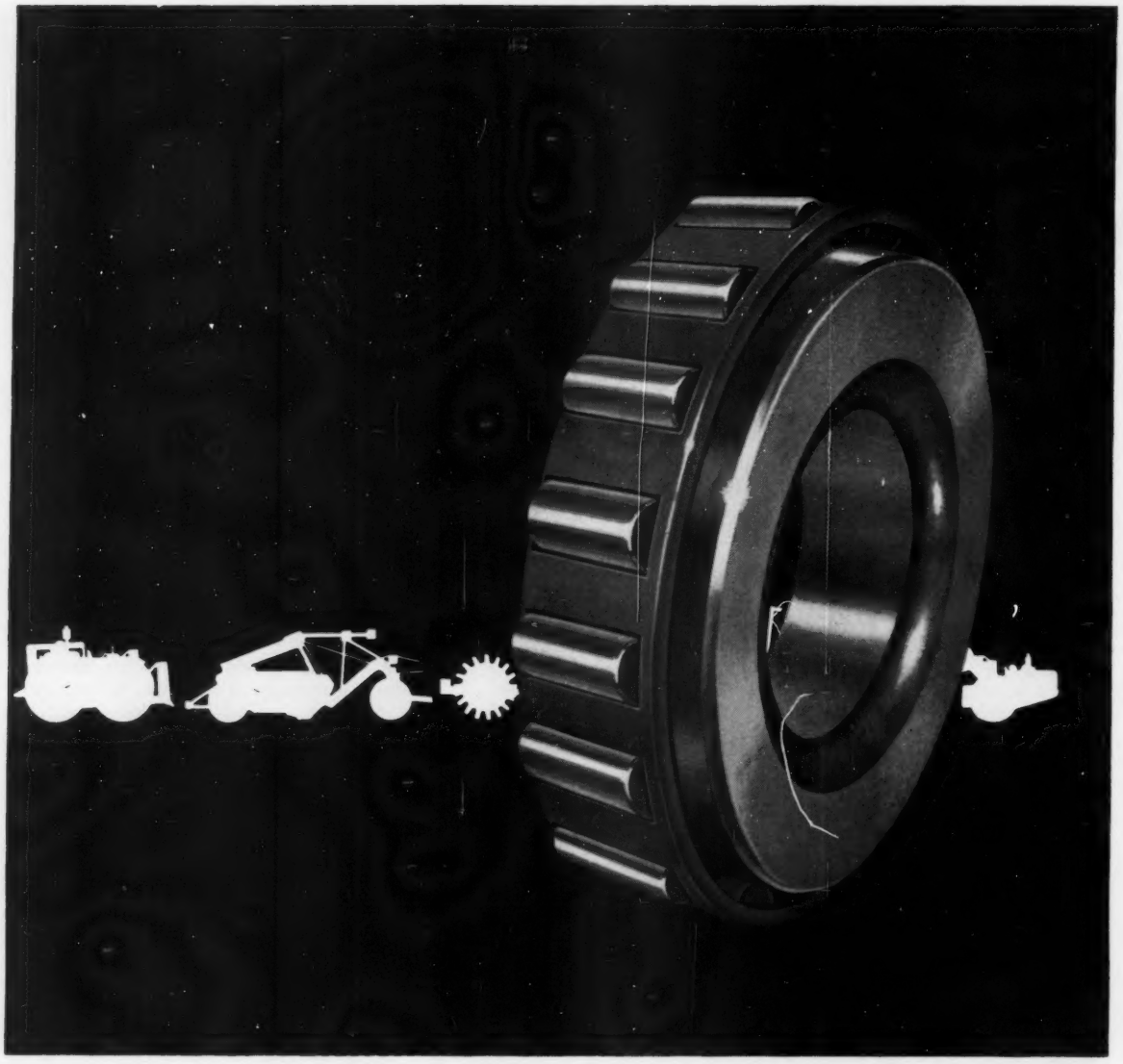
If you don't know the inside story of BANTAM's big production and low costs, see your BANTAM distributor *now*. Let him show you why it's the most job-proved rig in the industry.

World's largest producer of truck cranes and excavators

SCHIELD Bantam Co.

221 Park Street, Waverly, Iowa. U.S.A.

CM-161



one grease assures quality, convenience, economy

The performance of Esso Multi-Purpose Grease H equals or excels that of many "special-purpose" greases in all types of equipment—in such points as spring shackles, wheel bearings, track rollers, universal joints, steering linkages, water pumps. This has been proved by contractors in all phases of construction work.

Esso Multi-Purpose Grease H takes the severest punishment encountered by hard-working earth-moving and construction equipment. It *maintains* a highly effective protective seal around exposed bearings preventing contamination by water, mud, dust and dirt.

And Esso Multi-Purpose Grease H offers great cost-cutting advantages in handling and inventory since it takes the place of three or more greases. On-the-site applications are quicker and simpler. What's more, there's never the danger of using the wrong grease and causing costly damage and down-time.

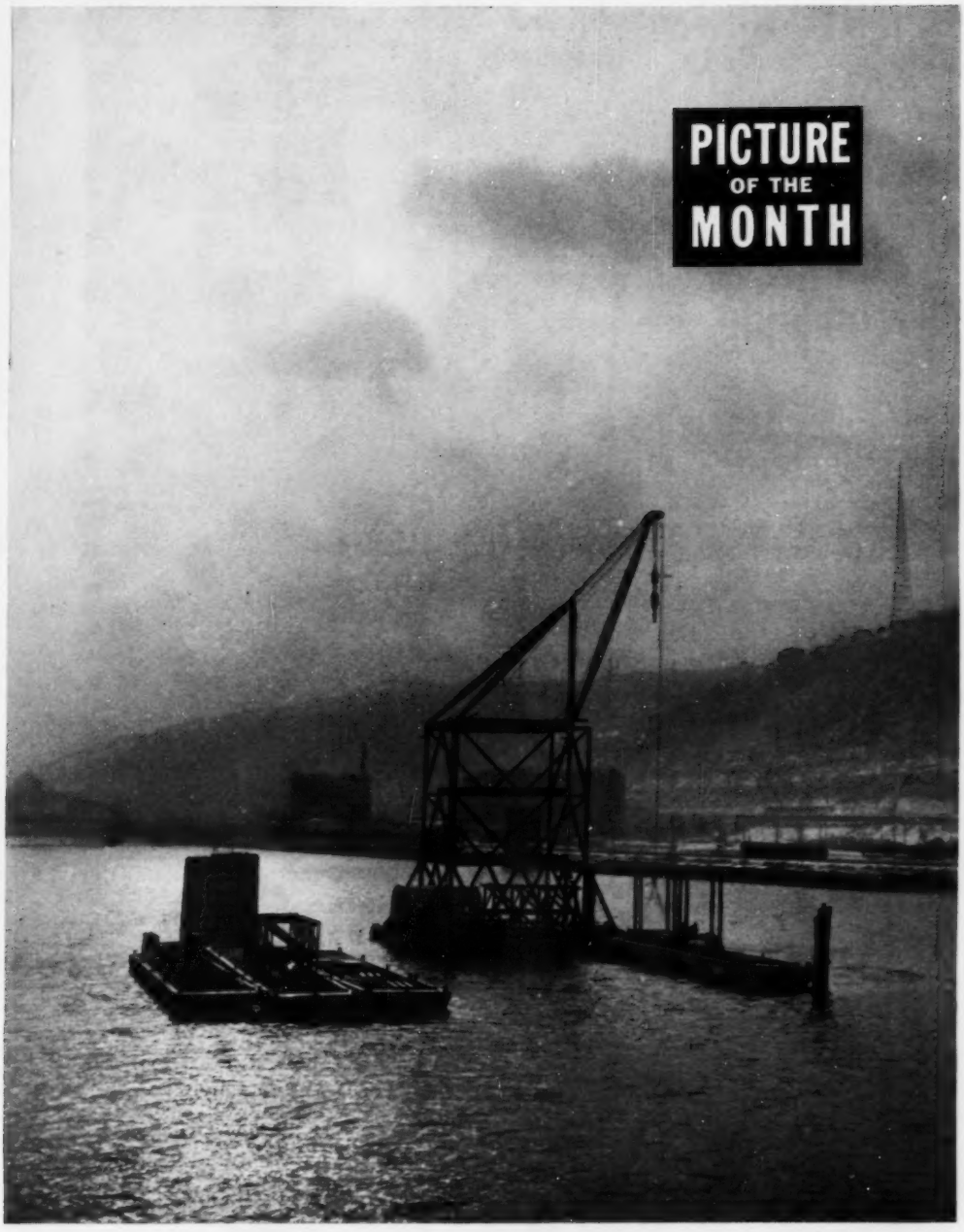
For specifics on how Esso Multi-Purpose Grease H can bring big savings to your operations, call our nearest Esso Office. Esso products and services are available through Esso Standard Oil Company plants and offices in more than 400 cities and towns throughout New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, W. Virginia, the Carolinas, Tennessee, Arkansas, Louisiana and the District of Columbia.

PERFECTED BY RESEARCH

MULTI-PURPOSE GREASE H

Esso

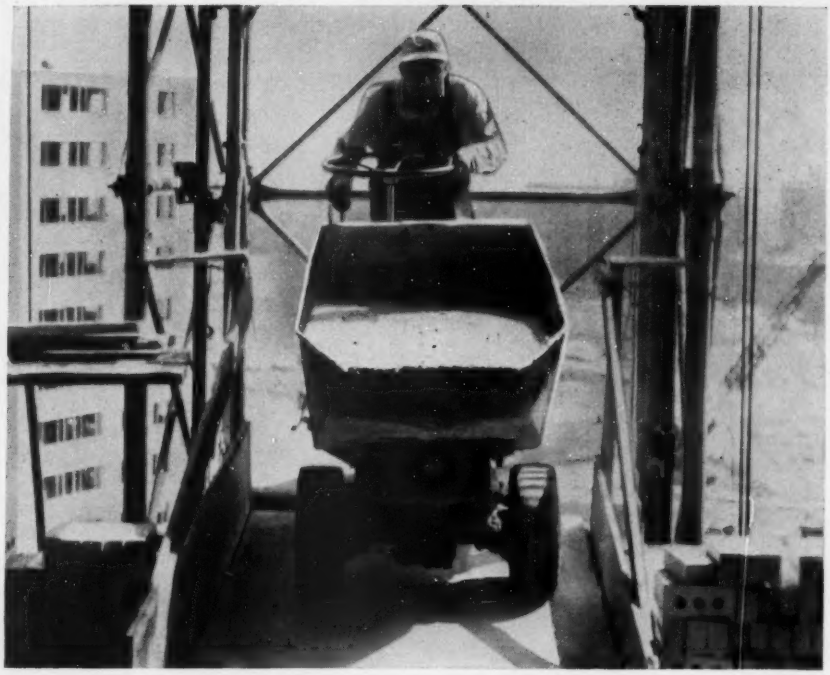
PROVED IN PERFORMANCE



Derrick Rides High

• Derrick with 100-ft boom reaches down from 90-ft-high steel tower to place temporary piles that will support falsework for the 750-ft tied arch span of the Fort Pitt Bridge over the Monongahela River in Pittsburgh. Tower is 60 ft square and floats on two 35x110-ft barges. From the tower American Bridge Division of U. S. Steel Corp. will erect the double-deck roadway. The 2,600-ft bridge is a vital link in Pittsburgh's ambitious Penn-Lincoln Parkway project.

6 MOTO-BUGS supply 50 masons in 9-story building



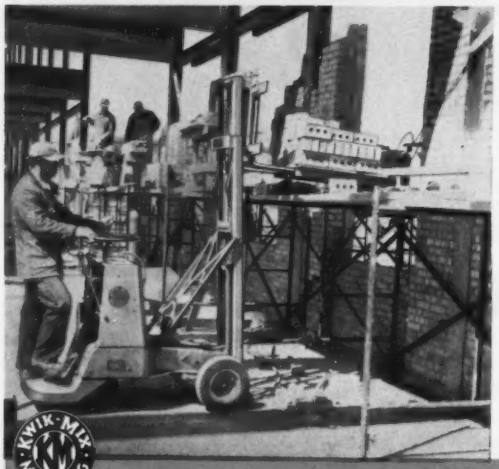
Riding an elevator-hoist to upper floor of new apartment building, Kwik-Mix Moto-Bug power wheelbarrow delivers another hopper-load of mortar to the 50-man masonry crew.

Moto-Bugs were changed from hopper bodies to flatbeds, as needed — carried block and brick from the masonry saw to point-of-use.

Distributing brick, block and mortar to a 50-man masonry gang on this 9-story housing project was a big job in itself! The men were laying about 30,000 brick a day. Hand wheelbarrows couldn't keep up with the crew, so the contractor mechanized his material-handling with a fleet of 6 Kwik-Mix S-10 Moto-Bugs. They were equipped with interchangeable ¾-ton capacity hopper bodies and flatbed platforms. Shuttling between ground stockpiles, masonry saws and mixers, the Moto-Bugs delivered mortar, facing brick and block in a steady stream to the work crew — rode to the upper floors on elevator-hoist. Light in weight, maneuverable, the S-10 turns in 61-inch radius — clears 33-inch doorways, can climb 16% ramp with ¾-ton load. 10 or 15 cu. ft. hopper and 32x48-in. platform are interchangeable with 6-foot fork lift. Better check the time and money *you* can save with low-cost Moto-Bug. Call Kwik-Mix distributor, or write us *today*.

KWIK-MIX Company, Port Washington, Wis.

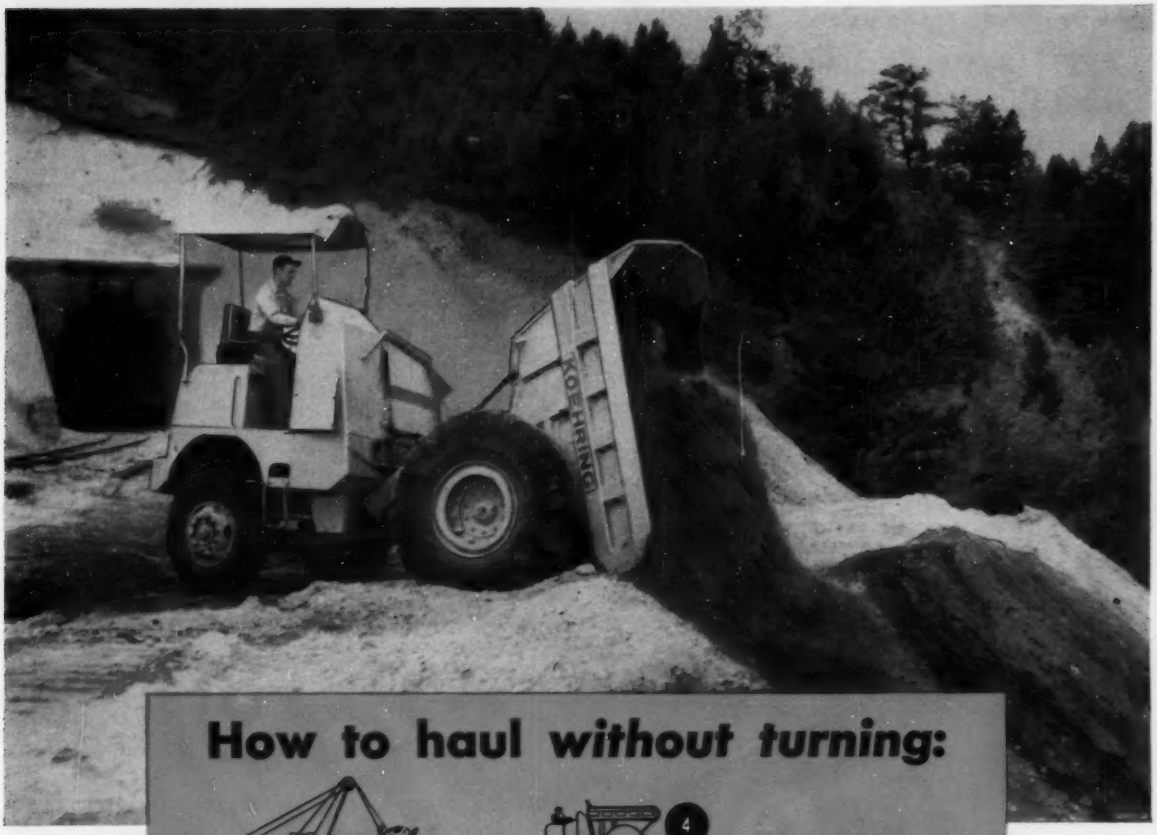
A division of Koehring Company



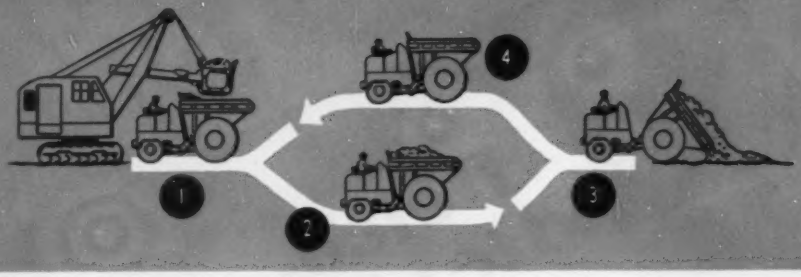
Hoisting palletized brick and mortar boxes onto scaffold for a new abbey, this S-10 Moto-Bug is equipped with interchangeable, 6-foot fork lift attachment. It has ½-ton capacity at 15-inch load center. A larger multiple-tool Moto-Bug is also available.

KWIK-MIX® *multiple-tool* MOTO-BUG®

Other products: CONCRETE • PLASTER-MORTAR • BITUMINOUS MIXERS



How to haul *without turning:*



1. **Dumptor gets load, with body forward in travel position.**
2. **Pulls away from shovel, body forward, ready to dump.**
3. **Dumps in one second — ready to shuttle back for next load.**
4. **Returns to shovel in high gear — all without turning.**

Shuttling between loading unit and dump area, Koehring® 6-yard Dumptor® travels round-trip *without turning*. It operates with equal ease in *both directions* along narrow haul roads, in tunnels, on overhead trestles — is especially practical for stockpiling, feeding crushers, loading cars. Dumptor gets this unique, no-turn advantage through a constant-mesh transmission that gives the same 3-speed travel in either direction.

Increases hourly output over 10%

By eliminating at least two slow turns on every trip, Dumptor cuts 30 seconds off normal cycle-time. This adds up to a substantial increase in yards or tons hauled per hour. For example — take a typical 1,000-foot haul where you are getting an average of 13.6 trips an hour with 2-turn operation. Even if Koehring Dumptor took the same time to load, haul, dump and return, its *no-turn* advantage would give you 15.4 trips. That adds up to an increase of 1.8 trips an hour on the same 1,000-foot haul.

Gravity-dumping cuts another 15 to 25 seconds off cycle-time. There's no waiting for slow-acting body-hoists. Operator trips the release lever, and *gravity* dumps the 6-yard load in *one second*. Costs stay low, because with gravity-dump, there are no expensive hoist replacement parts, or hoist maintenance.

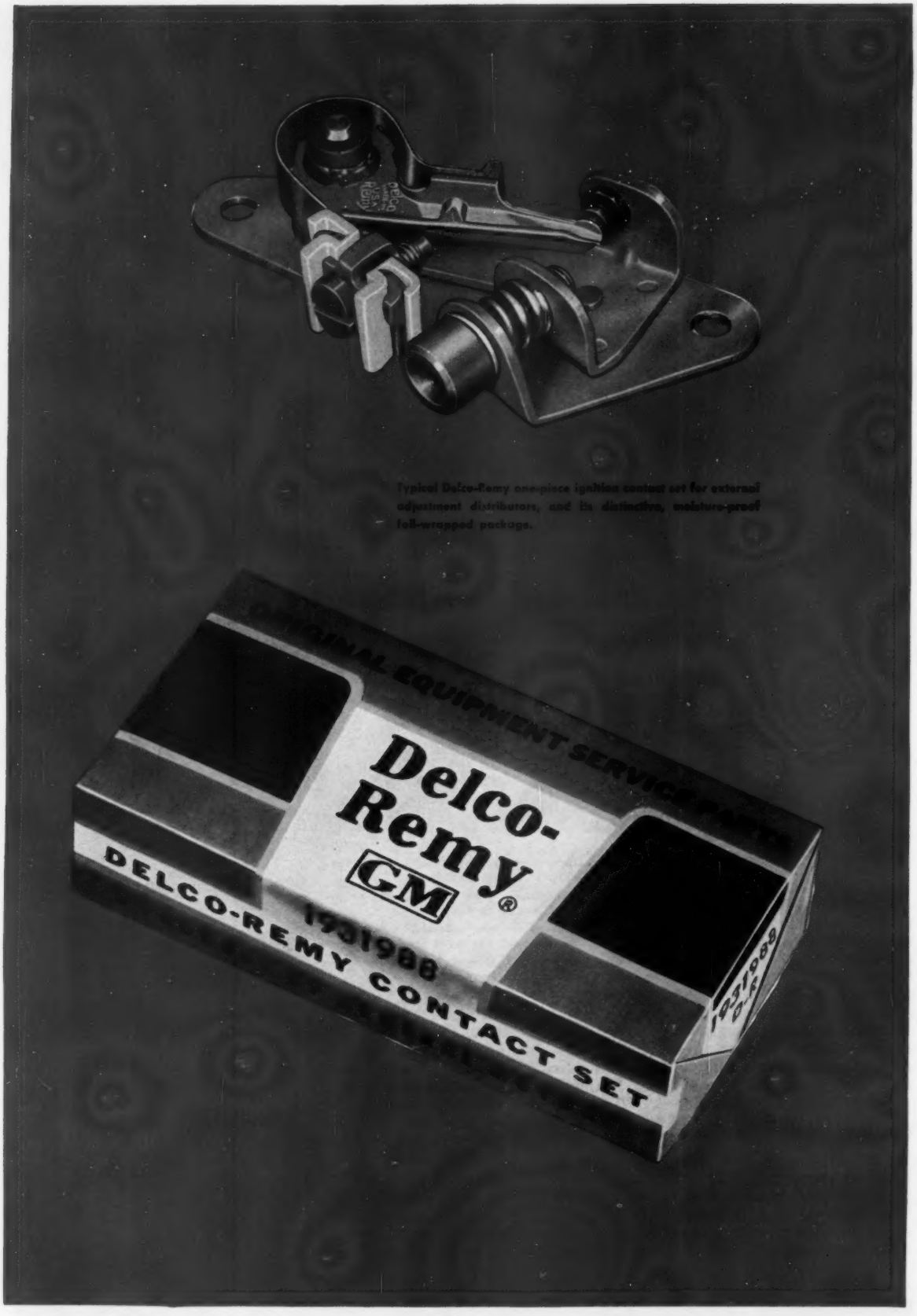
Check what these Dumptor advantages mean in increased production, lower costs on your work. Call your Koehring Distributor or write for more information to:

KOEHRING DIVISION of Koehring Company, Milwaukee 16, Wisconsin

K812

KOEHRING® DUMPTOR®

EXCAVATORS • CRANES • *twinbatch*® PAVERS • FINISHERS • MUD-JACK®



Typical Delco-Remy one-piece ignition contact set for external adjustment distributors, and its distinctive, moisture-proof foil-wrapped package.

DELCO-REMY LEADS THE FIELD WITH NEW ONE-PIECE, PREADJUSTED IGNITION CONTACT SET FOR THE REVOLUTIONARY EXTERNAL ADJUSTMENT DISTRIBUTOR

Fleet operators—this new, completely assembled, factory-adjusted unit developed for Delco-Remy external adjustment distributors offers you these important advantages:

1. One-piece construction for easier, quicker installation.
2. Fully adjusted, including spring tension and contact alignment.
3. Convenient primary terminal for easy attachment and detachment of leads.
4. Revolutionary new adjusting screw permits easy, accurate adjustment of cam angle *while the engine is running.*
5. New moisture-proof, heat-sealed foil package protects contacts from dirt and oxidation, is easy to stock and identify.

Keep the electrical systems of your Delco-Remy equipped vehicles balanced by using only Delco-Remy original equipment service parts. These new Delco-Remy ignition contact sets, built to highest quality standards by the original equipment manufacturer, are available from your car or truck dealer or the United Motors System.

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

GM GENERAL MOTORS

GENERAL MOTORS LEADS THE WAY—STARTING WITH

Delco-Remy

ELECTRICAL SYSTEMS

NO HEAD ANGLE ADJUSTMENTS TO MAKE WITH...

Clipper
"SAILS RIGHT THRU"
SUPERMATIC MASONRY SAW

HI-LO Control Wheel Does Everything

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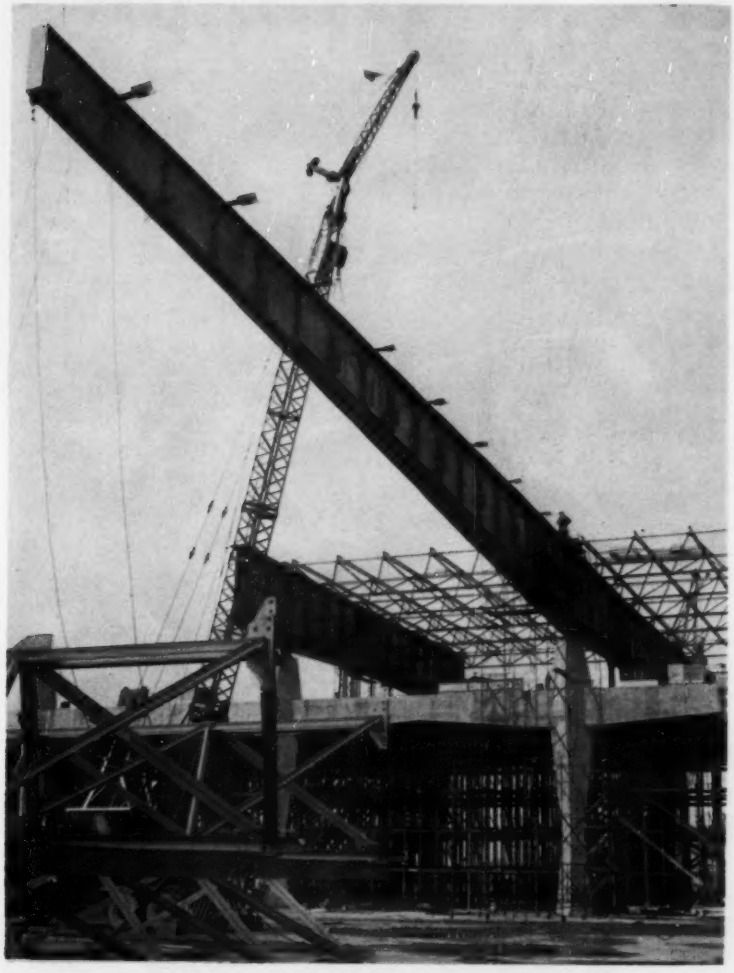
Construction News in Pictures . . .



Record Girder

Crane erects welded plate girder 365 ft long, one of seven that will go into the new United Air Lines hangar near San Francisco's International Airport. The hangar is a double cantilever structure with a three-story central core for shops and offices. The 125-ton girders were fabricated by Pacific Iron & Steel Corp. General contractor is Dinwiddie Construction Co.

Marine Maneuvers

A pair of Marine Corps helicopters land an 1,800-lb metal lamp housing in place on top the new 148-ft Cape Fear lighthouse in North Carolina. The novel airlift was the idea of W. F. Brinkley of Granite Quarry, N.C., general contractor on the job. One helicopter lifted the housing, but the pilot could not see to set it in place. So a second helicopter radioed instructions for positioning it.

continued on page 66

Amphibious Trencher

Digging a pipeline across the marshlands of southwestern Louisiana calls for equipment with special amphibious capabilities. To handle the job, United Gas Company fitted a Cleveland trencher with pontoons and hooked on a "marsh buggy" to help it along. Shallow water covers much of the right-of-way for the line.

Toughest....Strongest

Specify Generals on your new equipment

THE GENERAL TRUCK TIRE

Tire Ever Built!

THE ALL NEW

GENERAL

L LOGGING
C CONSTRUCTION
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- crawler-like FLOTATION
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No matter what the job, weather, or terrain, this big husky new General LCM is your assurance of dependable, profitable all-round performance.

Featuring the amazing strength of Nygen cord plus a wider and heavier tread, this great new LCM gives you flotation and traction beyond all comparison.

Choose your toughest job and then choose the dependable, deep-bite performance of the all new General LCM.

THE GENERAL TIRE & RUBBER COMPANY

Akron, Ohio

Progress at Priest Rapids

Work at Priest Rapids Dam on the Columbia River is moving ahead rapidly. Just 19 months after award of the $92-million contract, Merritt-Chapman & Scott Corp. has completed more than 33% of the job. The 4,500-ft left embankment (foreground) is well advanced. The 1,025-ft powerhouse and 11 bays of the spillway (center) are taking shape. On far bank is trench for right embankment.

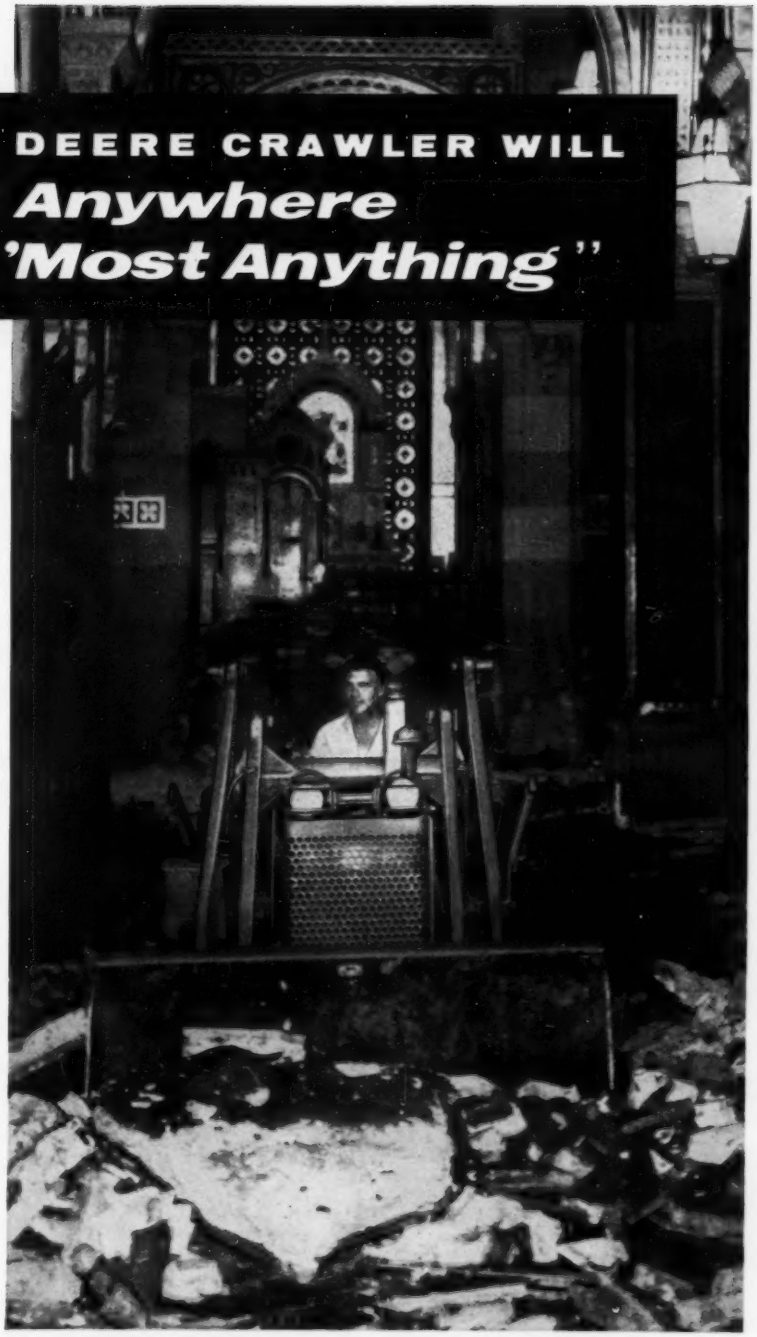
Double Duty

Western Engineering Co. of Omaha, Neb., has a Lorain truck crane working in two places at the same time. While the carrier hauls 25-ton girders through the Omaha business district to a building site, the superstructure, mounted on rails on the sixth floor of the building under construction, erects steel framing for the higher stories. Job is the Northern Natural Gas Co. headquarters building in Omaha.

Glen Canyon Road

Two Barber-Greene asphalt plants keep 50 trucks busy hauling mix for $1.5-million access road to the site of Glen Canyon Dam in Arizona. The base mix plant (foreground) has a capacity of about 350 tons per hour; the hot mix plant (right) turns out 210 tons per hour. Alexander Construction Co. of Minneapolis placed 165,000 tons of base mix and 109,000 tons of asphaltic concrete for the road.

"THAT JOHN DEERE CRAWLER WILL Go 'Most Anywhere Do 'Most Anything"



You've heard of "dozing" in church, but here is dozing of a different kind—with the John Deere Crawler-Dozer. Picture is an actual on-the-job scene taken in a Green Bay, Wisconsin, church that was undergoing a major remodeling.

Pinpoint turning, safe over-all weight, and compact design make the John Deere Crawler ideal for a wide variety of jobs in hard-to-get-at places, ranging from demolition of skyscrapers to close work around new buildings and in excavations.

Investment is low compared with other crawlers. And the rugged John Deere engine is famous for its dependable power and its outstanding economy on fuel, oil, and upkeep.

Modern features make jobs fast and easy: single or double hydraulic system to control all kinds of working equipment . . . direction reverser . . . 5-speed transmission . . . and auxiliary foot throttle are all available for the John Deere.

Don't put off getting full information on this modern crawler that handles so many jobs, so well.

For More Facts See Your Nearest John Deere Industrial Dealer

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Pouring concrete for one of 3 sub-surface structures designed to carry off surplus water from the re-channeled creek.

Crooked Creek was

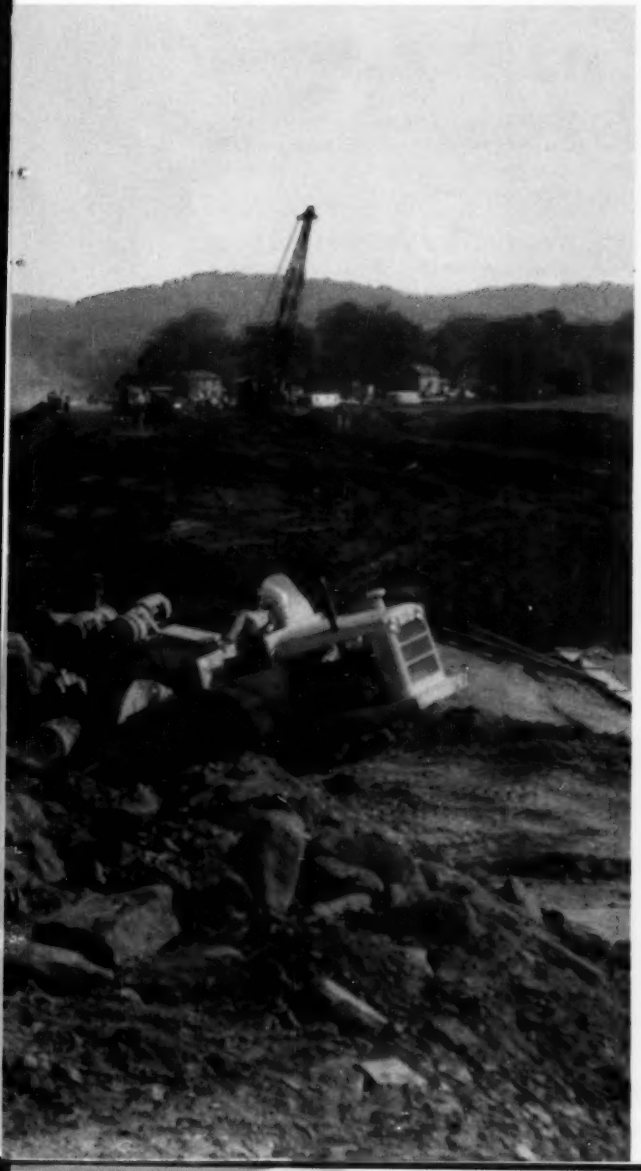
When a creek obstructs a 3½-mile road project, a good way out is to move the creek. That's exactly what S. Gavlik, Contractor of Glenwillard, Pa., is doing in order to re-locate Rt. 422 near Indiana, Pa. The entire project, let under the Federal Highway Program, involves 300,000 cubic yards of classified excavation and includes three sub-surface concrete structures to carry off surplus water from the creek.

The Gavlik people know they can depend on

in the way...Gulf helps Gavlik move it

Gulf for top quality products and prompt service. Says A. R. Tietjen, Superintendent, "We're extremely well satisfied with Gulf. Can't beat the products . . . or the service. We like the way Gulf has consolidated its product lines, too. This sure cuts down chances of using the wrong lubricant."

Gulf can play an important role on your construction jobs, too. There are 1500 strategically located Gulf warehouses ready to supply you with a dependable flow of job-engineered fuels and lubricants. A Gulf Sales Engineer, backed by 1300 scientists and technicians, is your direct link with the latest developments in petroleum science. He will provide, at no cost, expert advice on the use of petroleum products. For full information on how Gulf can serve you, call your nearest Gulf office. And for your maintenance crew, get a copy of the revised edition of "Contractors Guide." Just mail the coupon.



Left to Right: A. Tietjen, Superintendent; R. S. Garrison, Assistant Superintendent; H. H. Hossler, Gulf Representative; S. Gavlik, General Contractor.

Letourneau-Westinghouse 18-yard scrapers making cut for new right of way on relocation of Rt. 422 near Indiana, Pa. S. Gavlik, Contractor on the job, was faced with a creek that blocked the right of way. His solution: move the creek.

GULF OIL CORPORATION
Department DM, Gulf Building
Pittsburgh 30, Pa.

☐ Send copy of "Gulf and Your Business"
☐ Send copy of the new "Contractors Guide"
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2 ENGINEERED SHELL—Bronze shell of a Hercules cap goes through fifteen separate operations while it is being expertly shaped.

3 TOUGH, HIGH DIELECTRIC INSULATION—Leg wires of Hercules caps are coated with plastic insulation for outstanding toughness, resistance to abrasion, superior dielectric qualities.

4 SECURELY ANCHORED—A cast sulfur plug in the upper part of shell anchors entire firing mechanism in place.

5 WATERTIGHT WATERPROOFING—A special Hercules waterproofing formulation minimizes the possibility of moisture or dampness penetration.

6 7 DOUBLE-PACKED WALLOP—Bridge wire extends into the priming charge and makes positive contact to give rapid ignition.

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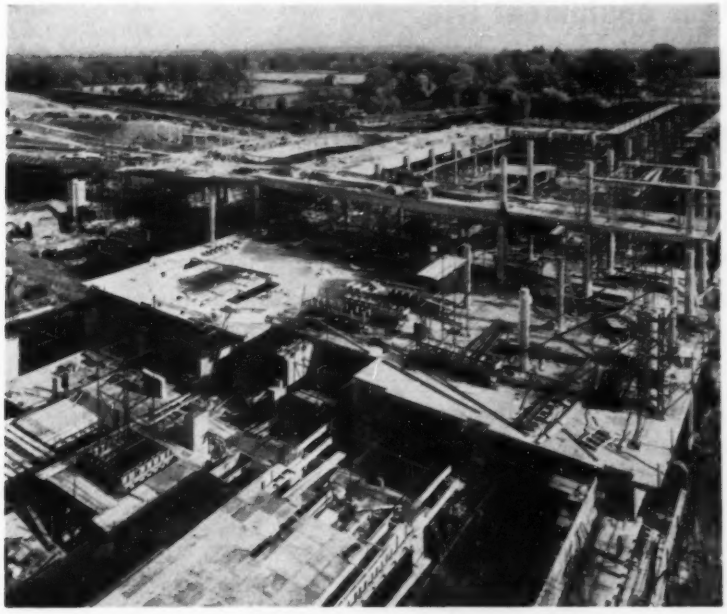
XR58-1

Construction 'Round the World

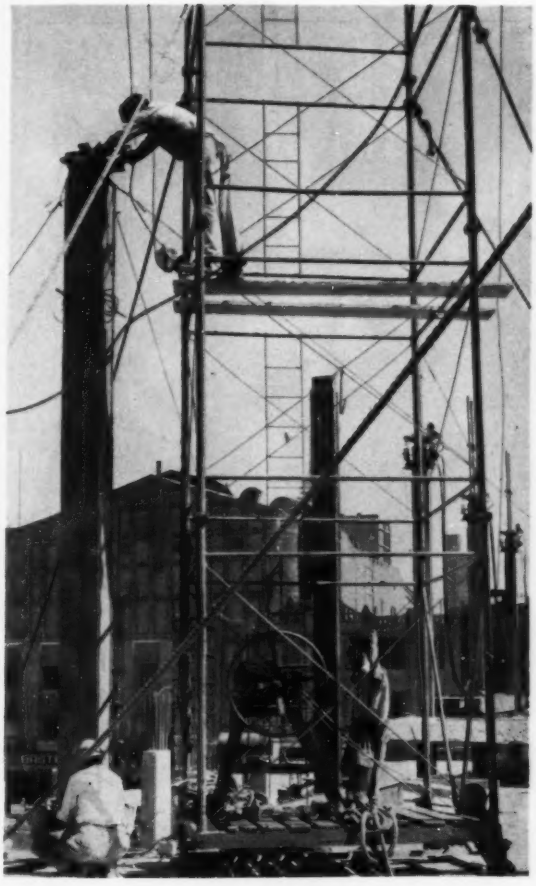


In England

Terminal Building under construction at Gatwick Airport near London is part of a major expansion that will make the field one of the three largest in area. Other work involves the construction of one runway 7,000 ft long, associated taxiways, perimeter tracks, control tower, and maintenance facilities.

In Mexico

Perched atop portable tubular steel tower workman plumbs section of steel column on 12-story lift slab job in Mexico City. This is one of the highest lift slab jobs ever attempted. Method of splicing column sections together during course of raising makes the job nothing more than a series of short lifts.



In Panama

Humber roller prepares subbase in front of paving train on two-lane Pan-American Highway under way in Penonome. Contractor J. A. Jones Construction Co. of Charlotte, N. C., works the roller ahead of the train to press out excess moisture in the base before 8-in. concrete pavement is placed.

(Advertisement)

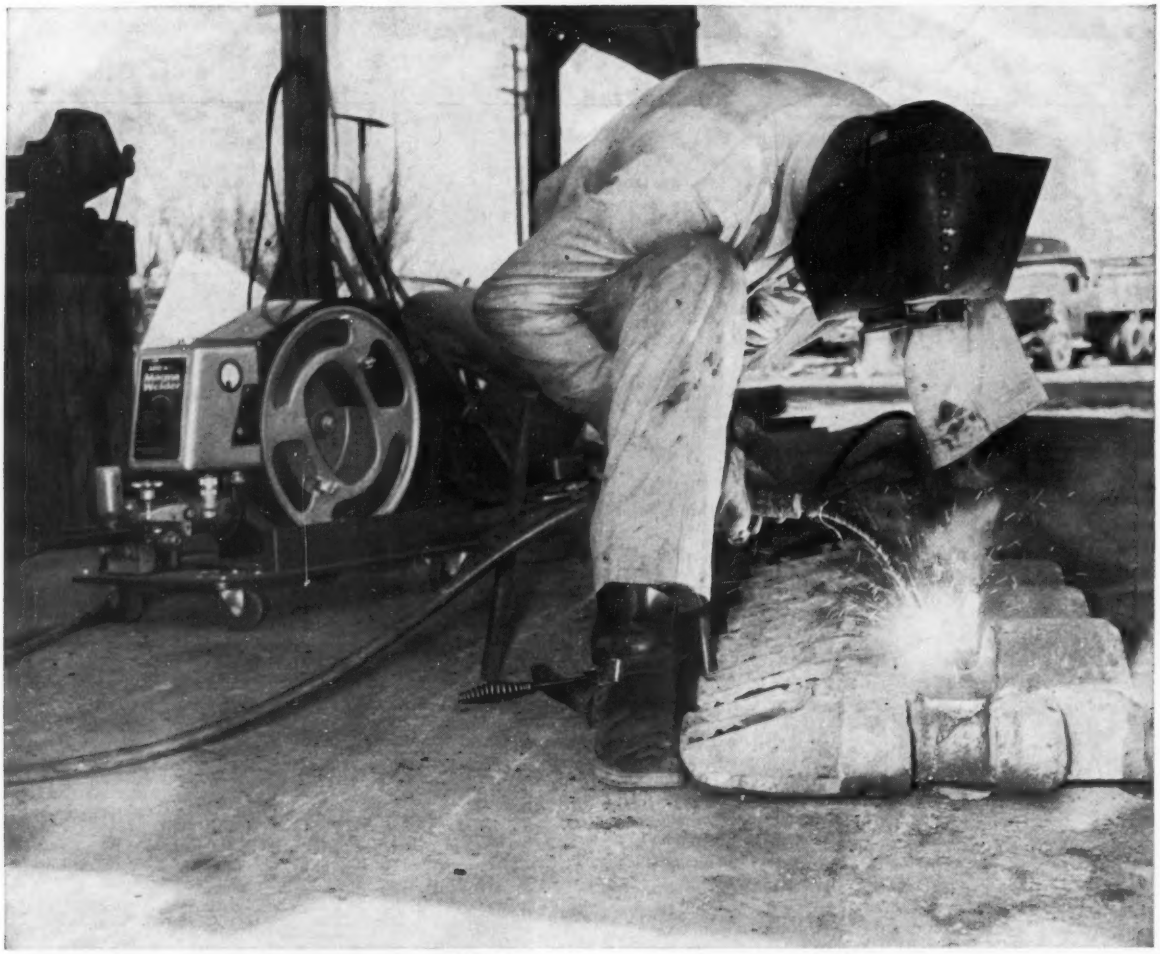
Stoody Semi-Automatic Hard-

- **with longer equipment life,**
- **less down-time,**
- **faster, easier reclamation of worn equipment!**

Everyone is always searching for *better, easier ways* to keep equipment in operation! Until the development of Stoody semi-automatic wires, maintenance hard-facing was limited to manual welding or fully automatic welding. Now, however, operators have a new tool which combines the advantages of *both* the manual and automatic processes with extreme flexibility of application. Hard-facing is usually applied directly without need for dismantling or positioning equipment. Speed of the process surpasses even automatic welding.

SEE OUR BOOTH NO. 617 AT THE WELDING SHOW APRIL 15-17, 1958

Weldor rebuilds shovel track pads with semi-automatic machine using Stoody Nickel Manganese wire to restore lost metal.



Facing Pays Off . . .

CONTINUOUS WELDING—Stoody semi-automatic wires are fed through any semi-automatic welder. Welding is continuous, without wasted stub ends or constant changing of electrodes. The wires are clean, bright, drawn to exact size and specially annealed for trouble-free feeding. Chemically coated papers prevent rusting in shipment.

COMPLETE WELD VISIBILITY—With open arc welding you see the weld as it is applied—vision is not hampered since most wires are fed bare. This means accurate welding and greater ease when working along edges or welding to a line.

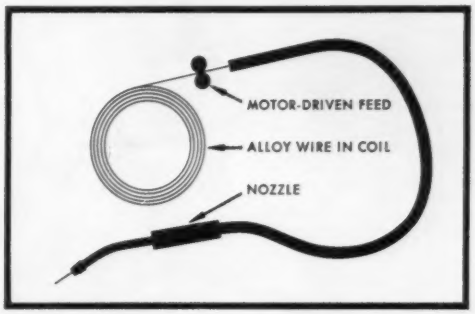
FASTER APPLICATION—High current density makes it possible to apply more pounds per hour. Usually the semi-automatic increases welding speed from 2 to 4 times! Lets you do those welding jobs that you've been putting off for lack of time.

HELPS ELIMINATE RUSH WORK—Faster application reduces the pile-up of work, takes the strain off your welding crew. Jobs go through smoother and easier. Rapid wearing equipment can be touched up during off time or between shifts.

EXCELLENT WEAR RESISTANCE—Stoody semi-automatic hard-facing wires are equal or superior in wear resistance to well-known Stoody manual electrodes of similar analysis. Low penetration causes less dilution with the base metal, therefore deposits are higher in alloy content, improving over-all wear resistance.

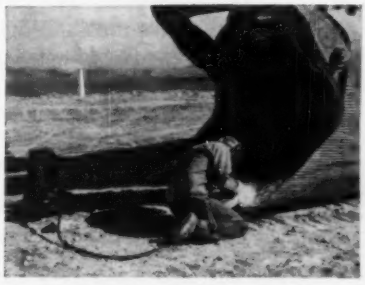
WIDE RANGE OF WIRES in low alloy to high alloy types gives you the only complete selection on the market, provides the one "best" wire for each wear condition . . . your assurance of *maximum protection per dollar invested!*

ASK FOR A SEMI-AUTOMATIC DEMONSTRATION! Our field engineers are equipped to demonstrate this new time, cost and labor saver right on your job. Arrange a date with your Stoody dealer! (Check the "Yellow Pages" or write direct.)



HOW SEMI-AUTOMATIC HARD-FACING WORKS Stoody semi-automatic wires are fed through the machine by motor-driven rolls. The motor is automatically actuated as the arc is struck. The weldor merely directs the deposit; wire feed is automatic and continuous as long as the arc is maintained. Certain wires are best applied by submerged arc, using the semi-automatic machine with a light positioner for full automatic welding.

Rebuilding tamps with semi-automatic machine. Pipe section is driven over worn feet, filled with Stoody 121. Cost is one-third of ordinary replacements . . . service life several times more.



Bucket lips, teeth and sides are hard-faced with semi-automatic welder without positioning work. Stoody 121 is generally recommended for position welding, as on bucket sides.

Impact breakers are readily hard-faced in position with the semi-automatic. Frequent applications are often necessary to maintain efficiency of crusher. Speed of application is important here.

Tooth from 5-yard bucket . . . repointer welded with Stoody Nickel Manganese and hard-faced with Stoody 121 by the semi-automatic process.

Carrying scraper blades, cutters and sides are most economically protected by use of the semi-automatic welder using Stoody 100 or Stoody 121.

STOODY COMPANY
11902 East Slauson Avenue
Whittier, California

not even king size boulders stopped this Manitowoc!

Huge boulders . . . too big to pass through the dipper . . . didn't stop this Manitowoc 2½-yd. Model 3500 shovel from loading out an average of 1200 to 1300 yds. of abrasive granite every 7½ hour shift. Goodfellow Brothers of Wenatchee, Washington used two of the Model 3500 rigs for handling rock on a Washington State Highway project. This was a rush job . . . moving over 160,000 yards of rock alone in four month's time.

This rock was hard to blast which resulted in the huge, hard-to-handle boulders. However, the Model 3500 shovels have the power, speed and capacity to keep haul units moving in a steady stream from the job area. Simple, balanced design throughout delivers more horsepower to the dipper . . . there's no wasted power. The entire machine has only 14 gears and pinions and only working gears turn . . . a power-saving feature found *exclusively* on Manitowoc shovels and cranes. A massive, one-piece carbody mounted on long, wide-spread crawlers provides greater stability. Many other features give you advantages to bid lower . . . make more money on any job.

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CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

Construction Methods AND EQUIPMENT

FEBRUARY, 1958

VOLUME 40 • NUMBER 2

HENRY T. PEREZ, Editor

Money for Highways

THE RATE at which states can obligate funds for interstate highways is nearing its peak. Between July 1, 1956, and December 31, 1957, state highway departments obligated $3,601 million to pay for construction, right-of-way, and preparation of plans for interstate and "ABC" (primary, secondary, urban) federal-aid highway projects. Obligations for the interstate system only were up $118 million over the U. S. Bureau of Public Roads estimate, while the ABC total was on a par with BPR's estimate.

To step up the current rate much more would mean overdrawing the highway trust fund. "We have already nearly reached the obligation rate scheduled for fiscal year 1958, which . . . is higher than the rate of obligations we will be able to make in the future without overdrawing the trust fund," Bertram D. Tallamy, Federal Highway Administrator, reported to a Senate subcommittee last month.

For the fiscal year ending next June 30, the trust fund estimate permits obligations to total $2,550 million, up 15% over fiscal 1957. But for fiscal 1959, which begins next July 1, obligations are scheduled to dip to $2,400 million. (BPR has allocated funds to states for the fiscal years 1957, 1958, and 1959 only.)

The states had obligated by December 31, 1957, some 72% of the interstate total and 56% of the ABC total allocated for 1958. Moreover, eight states have dipped into their fiscal 1959 allocations for interstate roads. Because the states are ahead of schedule, when taken together, the rate of obligations probably will taper off later on this year.

But that doesn't mean that contractors will find highway contracts on the downgrade this year. Part of the money already obligated and most of the funds to be obligated in the next 17 months are earmarked for construction contracts not yet awarded. And because the percentages of total obligated funds going to right-of-way and engineering have been higher during the early stages of the interstate program, construction contracts will account for a greater percentage this year and next as the program matures. Therefore, construction contracts should continue to rise during the calendar year 1958.

However, it's possible that a slowdown in obligations this year could result in a leveling off in contracts during 1959. Those states which have obligated the largest percentages of the funds already allocated will be the ones where contracts can be expected to taper off first. Among these are top highway construction states: Ohio, California, New York, and Illinois. On the other hand, states which are lagging behind should provide expanding highway construction markets as they catch up in this year and next.

Gantries on Temporary Trusses Set Big Prestressed Girders

HOW DO YOU PLACE heavy precast concrete girders atop high piers? One way, of course, is with powerful long-boomed cranes. But when Denver's A. S. Horner Construction Co. was faced with the problem, they figured out a different way—they rolled the girders into place suspended by gantries riding temporary steel trusses between pier tops.

With this unusual erection procedure Horner erected 128 prestressed girders for six bridges at the site of the new Air Force Academy near Colorado Springs. Four of the bridges were for highways. These called for 112 girders 120 ft long and 6 ft deep. Width varied from 3 ft at the upper flange to little more than 2 ft at the base, with a minimum web of 8 in. Each girder weighed 96½ tons. The number of spans for each bridge ranged from two to five, and there were eight parallel girders, 9 ft on centers in each span.

The two other bridges, to carry a single-track line of the Santa Fe Railroad, called for a total of 16 girders. These had the same sections as the highway girders (to reduce form costs) but were only 72 ft long and weighed 60 tons.

A number of factors dictated the method of girder construction. One was that pier height ranged up to 70 ft—a tough lift with such long and heavy girders. And ground beneath the bridges was uneven. Horner engineers felt there was considerable danger of dropping the massive units if cranes were used. They figured the gantry and temporary-truss method was safest and most economical.

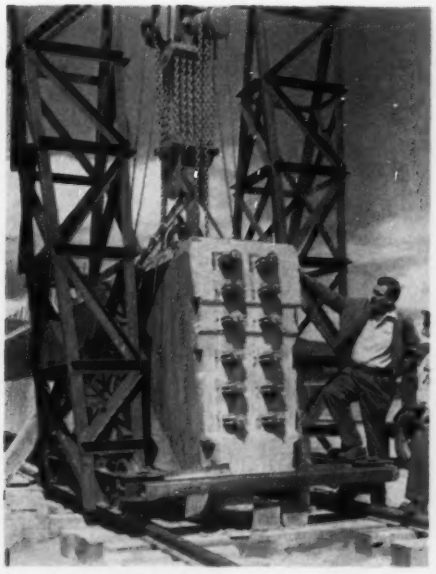
To make the erection scheme practicable, Horner cast each girder in direct line with its final position in the bridge. This meant a separate casting yard for each bridge, set back of one abutment.

Each of the casting yards for the highway bridges consisted of eight parallel beds 126 ft long. And there was sufficient space between beds and abutment to allow for storage of one set of girders—again on direct line with final placement.

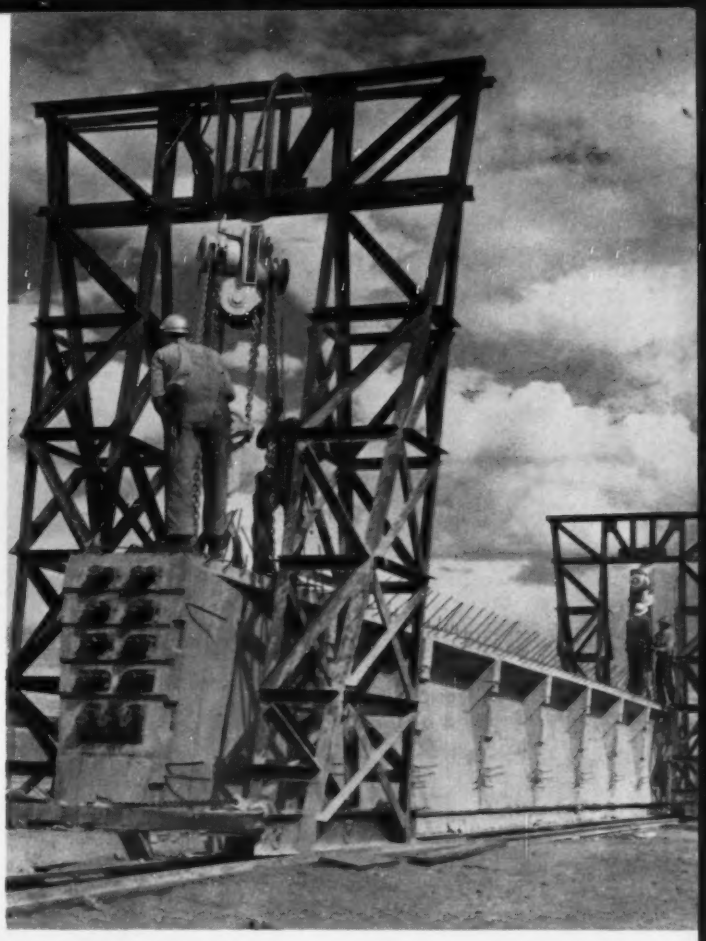
Girders were cast on concrete pads. Side forms were made in 20-ft panels of ¾-in. plywood braced by 2x6 studs and walers. The panels were bolted to inserts in the concrete pads and were tied across the top. Average use was 15 times before major repairs were needed.

For post-tensioning the girders, 12 Prescon assemblies were set in each form. Each assembly consisted of sixteen ¼-in.-dia high-tensile steel wires encased in Universal and Flexonics flexible metal sheathing.

After forms, reinforcing, and post-tensioning assemblies had been placed, concrete was poured. Smith 5½-yd transit-mixers, supplied by the contractor's batch plant on the site, deliverd con-



HANDLING — Gantry-mounted 50-ton hoist hooks on to girder to move it to place in bridge. Note stress-retention shims that hold Prescon post-tensioning tendons.



LIFTING—Two gantries raise 120-ft, 96-ton prestressed girder. Next they will be cabled together so they and load can safely be pulled to final position.

LOWERING—After rolling out on temporary trusses, gantries place girder to span from abutment (left) to pier. Operations are geared to set two units daily.

SHIFTING—After two spans of the outboard line of girders have been set (note shadow), Lorain crane moves triangular trusses so second line can be erected.

GANTRIES SET PRESTRESSED GIRDERS . . .
continued

crete to a bucket swung to the forms by 25-ton Lorain crane.

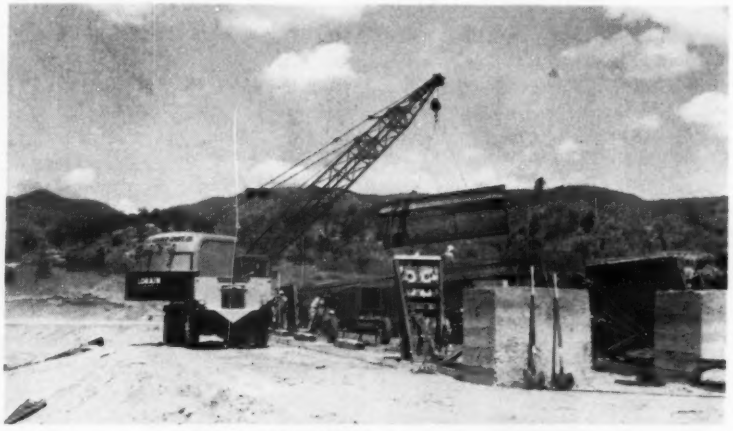
Concrete was a 7½-sack mix of Type 1 cement with 1,300 lb of sand, 1,760 lb of maximum ¾-in. coarse aggregate, 30.5 gal of water, and 1.88 lb pozzolith. This gave about 4% air entrainment, 2-in. average slump, and nearly 6,500-lb seven-day strength.

When the poured girder reached a minimum 4,500-psi cylinder strength, usually in four to five days, it was prestressed. For this, a 100-ton Simplex center-hole ram pulled all 16 button-head wires of the Prescon post-tensioning assembly. With the tendons elongated, pre-cut steel shims were placed to hold the stress, and the jack was shifted to the next assembly. Total prestress in the girder was about 700 tons.

To handle completed girders, Horner built two steel-frame gantries. The gantries straddled the girder and raised or lowered it by Wright 50-ton chain hoists hooked to lifting loops near girder ends. Gantries stood 17 ft high. Fitted with three double-flanged wheels in each side, the gantries rode 56-lb railroad rail.

At the casting yard, 30-ft sections of rail attached to short wood ties led to the abutment. From here on out, each rail was supported by a 120-ft-long tri-

GIRDER MANUFACTURE—Prestressed units are made in yard at bridge abutment, on direct line with final location in bridge.

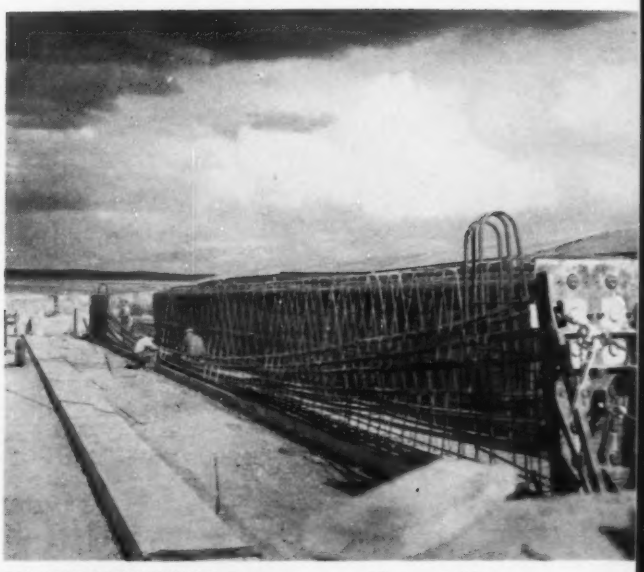


FORM PLACEMENT—Truck crane handles 20-ft side panels of plywood and lumber. Concrete block is end-bulkhead anchorage.

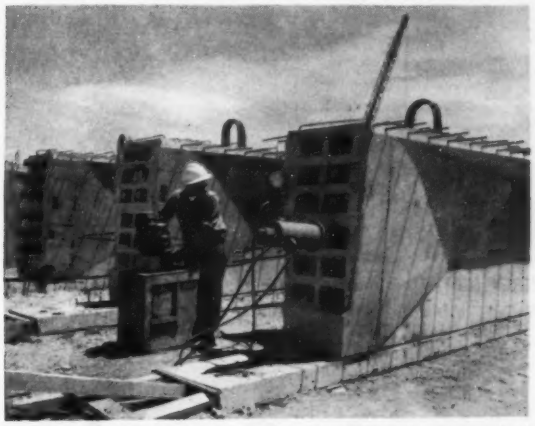
DIAPHRAGM FORMING—Wood forms hang from timbers across tops of the girders.

SLAB POURING—Smith mixers dump into Railporter that takes concrete to bridge.

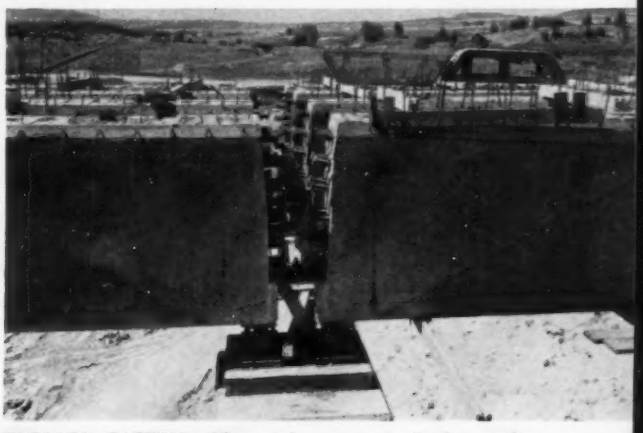
TENDON PLACEMENT—Prefabricated Prescon prestressing assemblies are unreeled from truck and anchored to end bulkheads.



TENDON ADJUSTMENT—Prestressing assemblies are held to correct sag and horizontal curvature by ties and movable bulkheads.



TENDON TENSIONING—Gasoline-driven Greenlee pump feeds oil to Simplex 100-ton center-hole ram that prestresses girder.



IN-PLACE CASTING—After girders are set, diaphragms between them are poured. Then 7-in. concrete deck slab is paved.

angular steel truss of 3x3 and 3x5-in. angles. There were four of these temporary trusses. Here's how they were used:

First a span of eight girders was cast, stressed, and moved ahead to storage. Then a second span of eight was made. When the girders were ready for placement, the temporary trusses were set up in the first line—to span from abutment to Pier 1 and from Pier 1 to Pier 2.

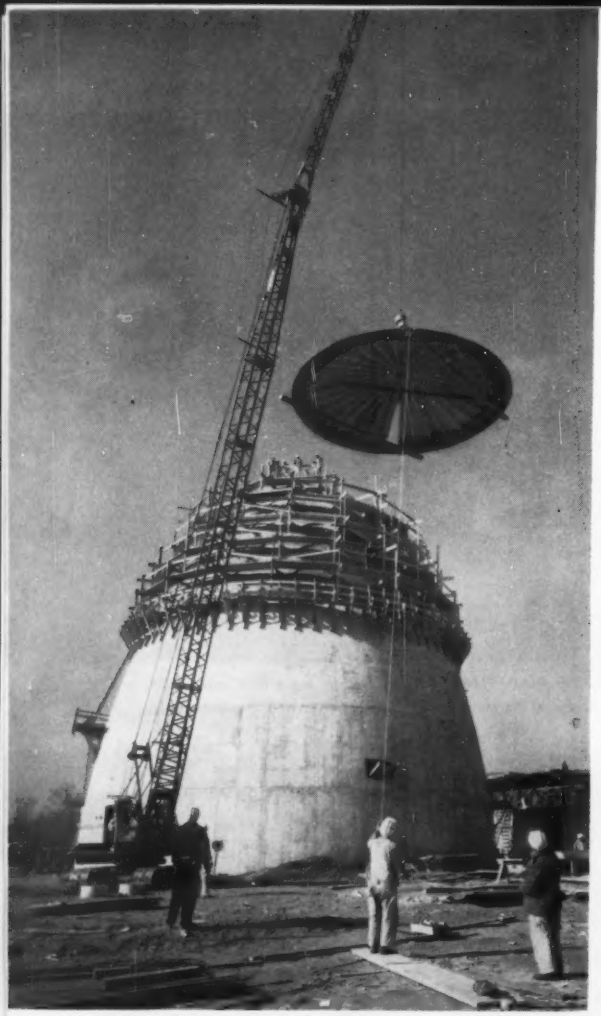
The gantries picked up the first Span 2 girder and rolled out to lower it into final position—a winch on a White truck, pulling on a cable through a snatch block, supplying motive power. Then the gantries returned to pick up and place the first Span 1 girder. With these two girders set in line, a crane moved the temporary trusses and gantries to the second line of Span 2 and Span 1 girders. This erection procedure was continued for the width of the bridge.

Then the rest of the girders for the bridge's remaining spans were cast on the original beds. At the same time, diaphragms on 20-ft centers between erected girders were formed and poured, and decks concreted in Spans 2 and 1. When all was ready, gantry tracks were placed on the completed part of the deck and the temporary trusses set from Pier 2 onward. Then they erected the rest of the girders as before.

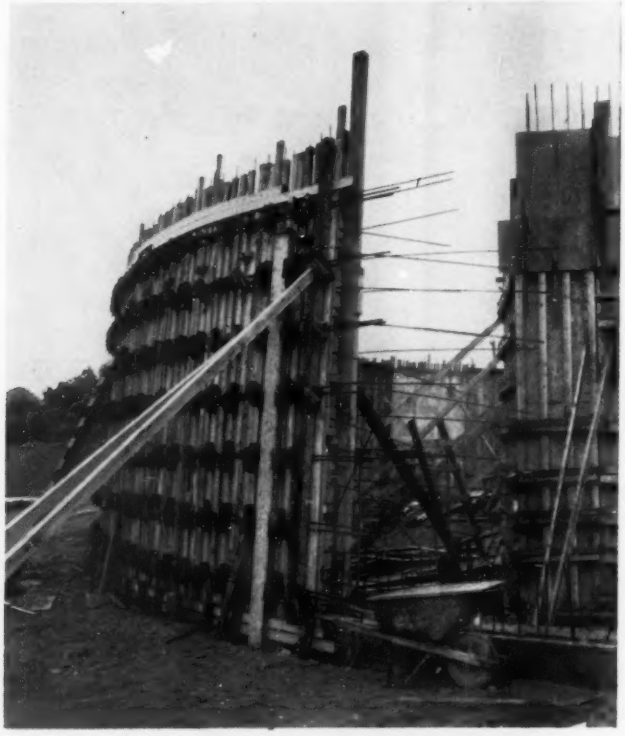
The gantries and temporary trusses represented a substantial investment of about $15,000. Nevertheless, Horner officials say the erection method was most economical. And they expect to recover some of the original cost through use of the equipment or of the steel on other jobs.

Horner engaged L. Boduroff, Denver engineer, as consultant on prestressing and to design the steel trusses and gantries. Prescon Corp., Corpus Christi, Tex., supplied the prestressing tendons, stressing and grouting equipment, and supervised the prestressing operations. For A. S. Horner Construction Co., Denver, John W. Brown was project manger, Carl Boulden was general superintendent, and Robert D. Thompson was project engineer. The bridges were designed by Skidmore, Owings & Merrill, Chicago.

Dome 87 ft high for enclosing research reactor near Princeton, N.J., has 12-in.-thick walls topped by 3-in.-thick Gunited crown.



CAP FORM—Bucyrus-Erie 30-B crane places form on crown of dome. Scaffold outriggers project through holes in the form.



FIRST LIFT—Construction of reactor and dome walls is carried on simultaneously. Because of heavy magnetite concrete in reactor

Reactor Dome Demands Complex

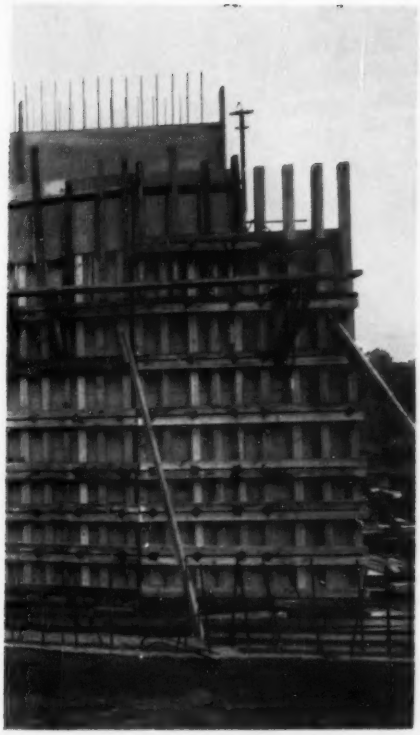
A BEE-HIVE SHAPED concrete dome for enclosing a new atomic research reactor near Princeton University offered some challenging formwork problems for the contractor, Turner Construction Co. of New York. Much of the 87-ft high structure has 12-in. thick walls, including ribs and a ring girder to carry a permanent revolving 12-ton overhead crane. And complex two-way curvature of the structure demanded sharp planning to control form costs.

Turner is handling the $3-million job for a group of 10 large industrial firms, all of whom will share the research facilities of the reactor. The project consists of a pool-type reactor housed and contained in the 87-ft dia dome, and an adjoining building offering private labs for each firm, plus a special hot-cell lab used jointly by all members to analyze safely the radiation results of their experiments.

Although the vertical cross section of the dome resembles a parabola, actually it is made up of a series of arcs. The first 27 ft has 12-in. walls, the next 21 ft reduces to 8 in., and the remaining crown is built up with 3 in. of Gunite. The horizontal cross section is circular.

For Turner, the job was strictly a formwork problem. They had to design forms that were rugged enough to contain the heavy wall, flexible enough to mold the curvature, and capable of 10 reuses.

To simplify form fabrication, Turner first built a full-scale horizontal templet of the dome's half cross section. Set level and resting on the ground, the templet consisted of a plywood working platform on which the exact curve of the dome was laid out. The platform was built in two sections—a curved strip 4 ft wide on which the curved surface was inscribed, and a straight strip on which the dome's vertical axis was laid out. To maintain positive measuring points, Turner marked the exact lines with 2x2-in. wood strips nailed to the platforms. These lines were established by simply measuring the given radii from a number of positions on the laid-out axis.



walls, forms are extra sturdy. Reinforcing rods serve as walers on dome form.

BASIC PANEL—Crane places one of basic inside panels. Six of these 15-ft panels comprise a 90-ft section, or one-third of each of the dome's three horizontal rings.

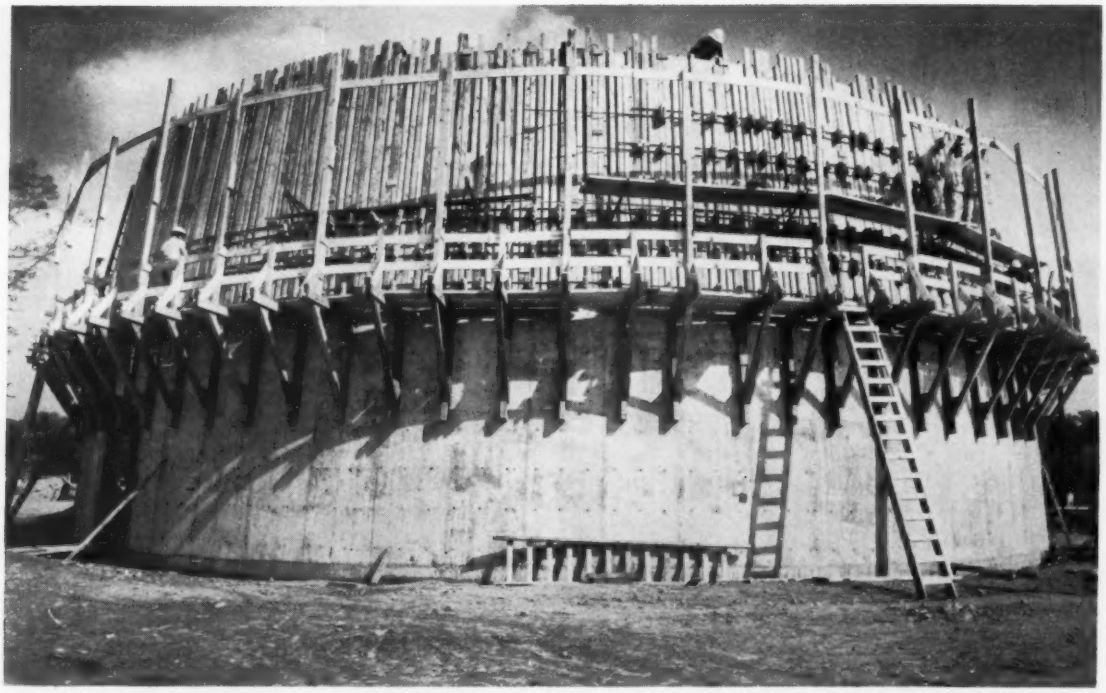
Formwork

Throughout the job the templet proved its worth. It enabled carpenters to visualize easily the shape of the odd structure, gave them a constant check on their work, and greatly simplified form fabrication.

Because of shrinkage problems, Turner was permitted to pour only one third of the wall circumference at a time. And for that reason they designed one 90-ft-long arc of forms to be used three times on each of the three wall lifts. They were rebuilt later for pouring the crown.

The basic piece of formwork was the 15 ft long inside panel, six of which comprised a 90 ft section or one-third of each horizontal ring. These inside panels

WELLPOINTING—Deep foundations for reactor's underground pumping and cooling units are excavated behind Griffin two-stage wellpoint system. Points are 18-ft long.



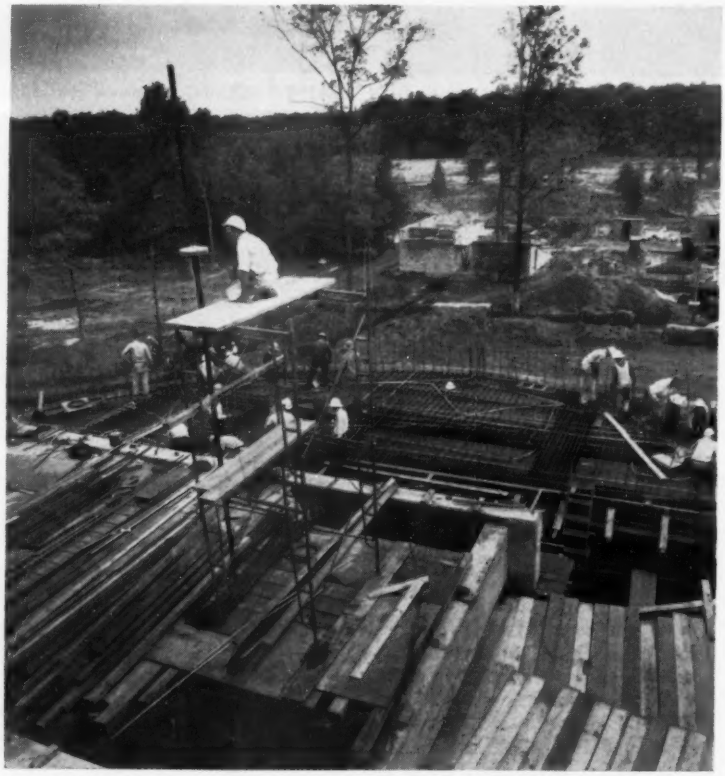
SECOND LIFT—Exterior form panels are simple. They consist of a single layer of ⅜-in. plywood backed by 2x4 studs laid flat and close together—but not attached. Six levels of tie-rods spaced 16 in. apart position and tie them to the inside panel.

served as the base for the outer form, which was kept in place and at the proper distance from the inner form by adequately spaced ties.

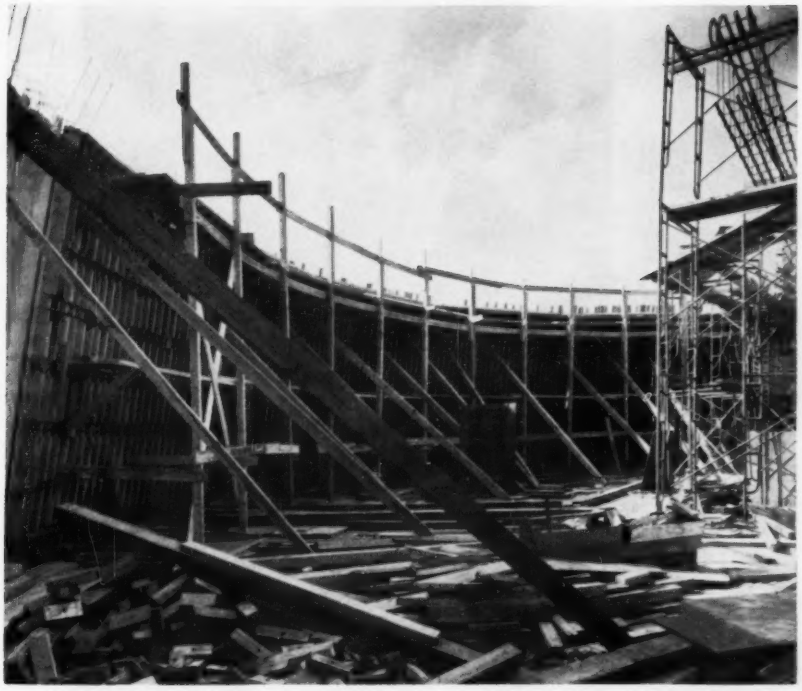
Basically, the inside form panels consisted of plywood sheets backed by 2x6 studs 8 in. apart. To facilitate bending without sacrificing strength, Turner made the panels of two layers of ⅜-in. plywood. The vertical curvature of the panel was obtained by shaped filler strips between the plywood and studs. And this is where the templet really paid off. By simply placing the stud against the templet, workmen could mark the exact cut of the filler strip.

The panel's horizontal curvature was fixed by 2x12 sills and header plates, to which the vertical studs were fastened. The outside panels consisted of a single layer of ⅜-in. plywood backed by 2x4 studs laid flat and close together but not attached to the plywood. They were positioned and tied to the inside panels by six levels of snap-type tie-rods spaced 16 in. apart.

Because of the curvature, the contractor substituted pairs of No. 6 reinforcing rods for conventional wood walers. They could



CENTERING POLE—Guyed pipe with rotating wood disk at its top is extended vertically as structure rises to mark axis of dome, making it easy for workers to keep forms aligned.



BRACING—Although curvature of inside panels makes them almost self-standing, they were braced back to mud sills placed radially and blocked against reactor pool base.

INTERNAL FRAME—To support working platforms and also to serve as reaction for wall braces, timber frame of 6x6 posts is built up from the mud sills to level of crane.

be bent easily and were easy to place. Metal wedges anchored the ties and the formwork in the conventional manner, except that wood blocks were inserted on the outside panels between studs and wedges. This was necessary because standard ties designed to work with wood walers were used, and naturally the button heads extended beyond the slim reinforcing-rod walers. Special length ties, obtained later in the job, were substituted to eliminate the need for the wood filler blocks.

When the circular foundation was complete, the contractor began erecting the first 90-ft arc of forms. The inside panels went up first and were braced back with 4x6's anchored to 3x12 mud sills placed radially and blocked against the concrete reactor pool base previously poured. Although the form leaned inward, extensive bracing was not needed because its arc shape made it self supporting.

The key problem in setting forms was precise positioning, but Turner found a clever way to do it. Because all radii measuring had to be done from the dome's vertical axis, the contractor erected a 2-in. metal pipe at the dome's center and placed guy wires to keep it plumb. On top they mounted a rotating wood disc in which a small hook was set exactly 6 in. from the axis. By swinging a tape from the hook, workers could quickly check the form's alignment at any level. As the dome was built up the pole was extended and the wood disc raised to the top.

Concrete was poured by crane and bucket and vibrated vigorously to achieve proper density. Specs require that the dome must be essentially airtight to prevent radiation hazards. Operations within the beehive will be conducted in a vacuum, with a resulting negative pressure on the dome of 0.5 psi. About two days after the pour, forms were stripped and moved to the adjacent section, and the operations were repeated.

On the second 13-ft lift, only minor form modifications were required. Panels were easily remade to compensate for the smaller dia, and a scaffold and bracing frame was erected.

Around the exterior of the dome, a simple scaffold was constructed consisting of wood

GUNITING—Crown of dome is covered with tarps during cold-weather Guniting. Scaffold brackets are hung from wall by bolts.

REACTOR CORE—Circular hole in reactor is one of beam tubes through which radiation will travel. Note the overhead crane.

brackets hung from inserts placed at the top of the previous lift. Inside the dome, a frame of 6x6 wood posts was built up from the mud sills to serve as a scaffold to anchor the ends of wood raker braces and to support deck forms for pouring the first mezzanine.

On a 20-ft third lift, forms required more extensive modifications because they were required to mold the circumferential crane girder and its supporting ribs. However, the procedures were the same as before, and the internal frame was extended vertically to accommodate bracing.

Above the third lift the job changed radically. The remainder of the dome consists of a crown of 3-in.-thick Gunite-placed concrete, requiring only an inside form. Turner first erected the overhead crane on the ring girder, then built a working platform at that level by framing in to it from the girder. Then tubular steel scaffolds were brought in and erected on the working platform to support the crown form.

The crown was built up in several lifts by Gunite crews working from a series of circular scaffolds supported on outriggers anchored to the frame inside the form. They projected through holes in the plywood form. Located on the ground, Gunite machines were supplied by a Haiss conveyor and hopper working with a small mixer. In cold weather, the exterior scaffold was draped in tarps and two Silent Glow heaters were operated inside the dome.

All forms and concrete handling throughout the job was done by a Bucyrus-Erie 30-B crawler crane. The boom was lengthened periodically to a maximum of 80 ft. And a 15-ft jib was also added.

Reactor

Construction of the pool-type reactor structure was more conventional than the dome, yet it had several unusual features. The lower 12 ft of the pool, for instance, has 3 to 9-ft thick walls of magnetite concrete, weighing 235 lb per cu ft. The mix was tough to handle, and required double-strength forms and hardware. Walers were double 4x4's, and tie-rods were ½-in. bolts.

Heavy concrete was also required for the hot cells in the adjacent lab building. In fact, even the 3-ft thick doors of the cells were filled with heavy concrete. When completed, they each weighed 17 tons. Concrete of 300 lb per cu ft was obtained by the use of ferro-phosphorus.

Several secondary structures also presented problems because of the tough ground water conditions in the area. To build underground pumping and storage units, deep pits had to be excavated. And wellpoints were the best answer. With the help of engineers from Griffin Wellpoint Corp., Turner ringed the wet area with a 2-stage system. With one line driven at ground level and another 10 ft below ground, the 18-ft points lowered the water table sufficiently to permit construction without need of shoring and bracing.

The project is owned by the

TEMPLET—Dome nears completion, yet workers still find uses for full-scale horizontal templet of dome's half section. Complex curvatures are easily measured on the templet.

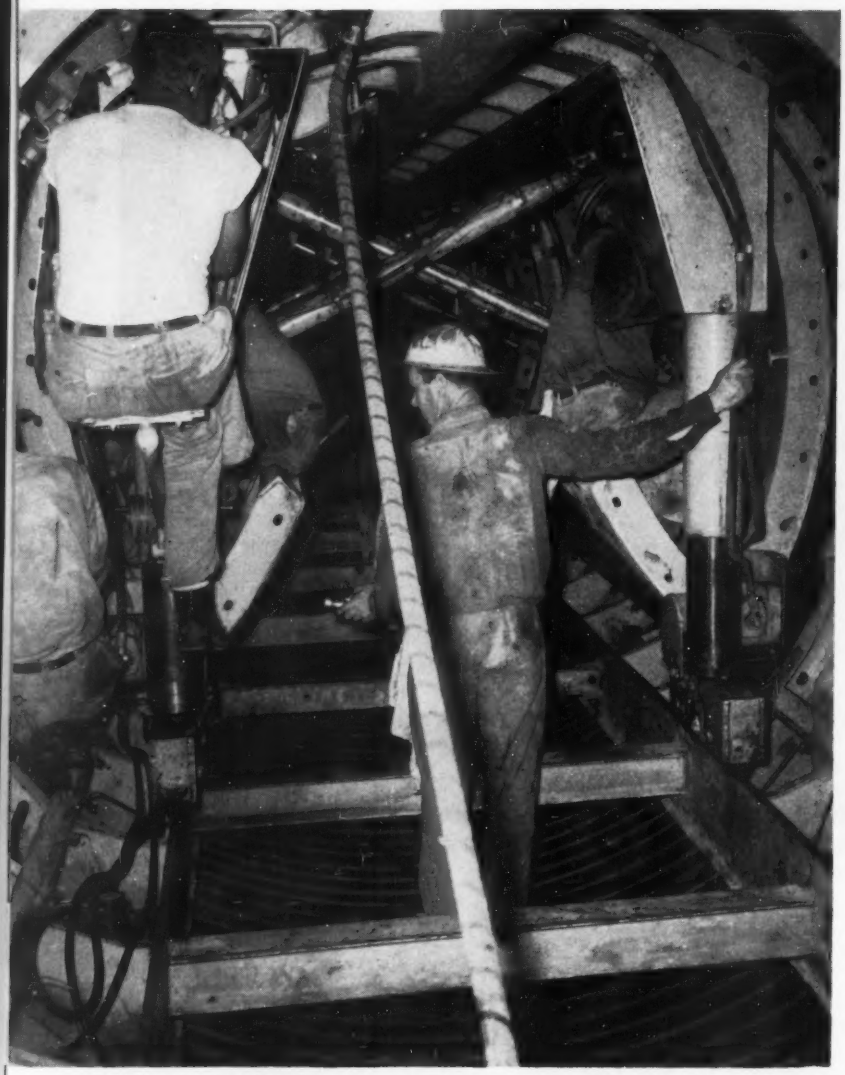
Industrial Reactor Laboratories Inc., and is being built under the direction of AMF Atomics (a division of American Machine & Foundry Company). Organizations sharing jointly in the facility are: National Lead Company, American Tobacco Company, Continental Can Company, Corning Glass Works, Socony Mobil Oil Company, United States Rubber Company, American Machine & Foundry Company, Atlas Powder Company, Radio Corporation of America, and National Distillers and Chemical Corp.

Personnel

The architects are Skidmore, Owings & Merrill, represented at the site by David Brown; structural engineers are Severud, Elstad & Krueger; mechanical engineer is Guy B. Panero with nuclear facilities design by AMF Atomics.

Turner Construction Company is the general contractor with John Sweeney as superintendent in charge and Theodore Frank as project engineer.

TEMPORARY PROTECTION—Panels made of 2x4 studs covered with VisQueen film enclose building, permitting winter work.



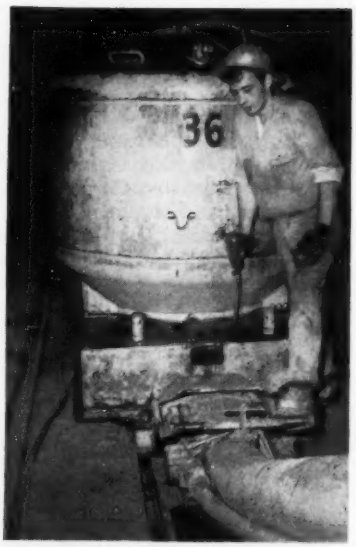
MOVING THE FORMS—Hydraulically driven jumbo handles 16-ft lengths of collapsible steel arch form. Only electric power is for lighting; oil and air do all the work.

Contractors driving a sewer tunnel through running sand last year developed unique shields that upped progress terrifically (CM&E, March, p 66). Now they've worked out improved lining techniques to help speed the job.

Try These Tricks For Faster Lining

HANDLE FORMS HYDRAULICALLY and place concrete pneumatically. That's the formula for speedy tunnel lining that is paying off for the Arundel-Dixon-Kemper contracting combine on the North Central Outfall Sewer in Los Angeles. On this 9½-ft finished-dia circular bore, driven as a 12-ft horseshoe, concrete runs 2 cu yd per ft of tunnel. Nevertheless, progress averages better than 128 lin ft of lining per day.

The collapsible steel forms that help make this speed possible are made up in 16-ft lengths—length being governed by available width of plastic sewer facing material that is draped over the form for embedment in the concrete. Each 16-ft form is composed of five sections connected by hinges. There are a crown sec-

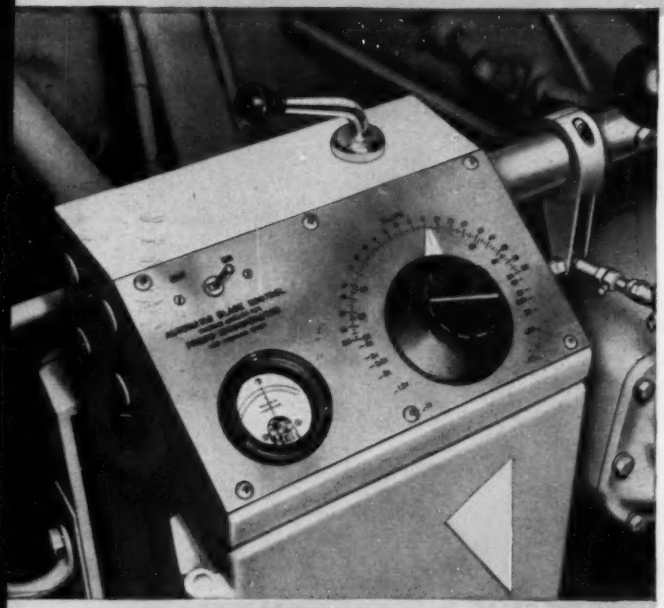


PLACING THE CONCRETE—Steel pressure vessel shoots 3 cu yd of mix into forms.

JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...

...IT CONTROLS BLADE SLOPE WITHIN ⅛" IN 10', REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within ⅛" in 10'* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾" longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6" higher and cab roof insulated to reduce noise level.

Increased versatility—4" longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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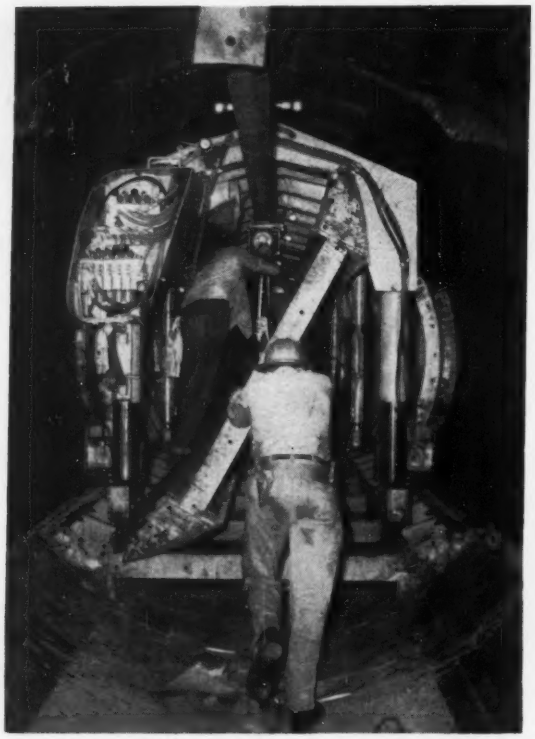
FOR HIGH PRODUCTION, EQUIP YOUR CAT MOTOR GRADERS WITH AUTOMATIC BLADE CONTROL



FIRST FORM-MOVING STEP—Invert bridge, picked up by air hoist, is tipped to pass into jumbo to be moved ahead to next pour.

SETTING THE GRADE—Steel pins are adjusted to get form support to exact elevation. Tunnel floor will be wetted before pour.

tion, two side sections, and two lower skirts. Separate steel panels form the invert.

The collapsible forms are supported at the base by a steel-frame invert bridge. The bridge, in turn, is posted to the tunnel floor by 1¼-in. dia rods on 8-ft centers on each side. No. 4 Acme threads on the rods where they pass through the bridge provide exact grade adjustment.

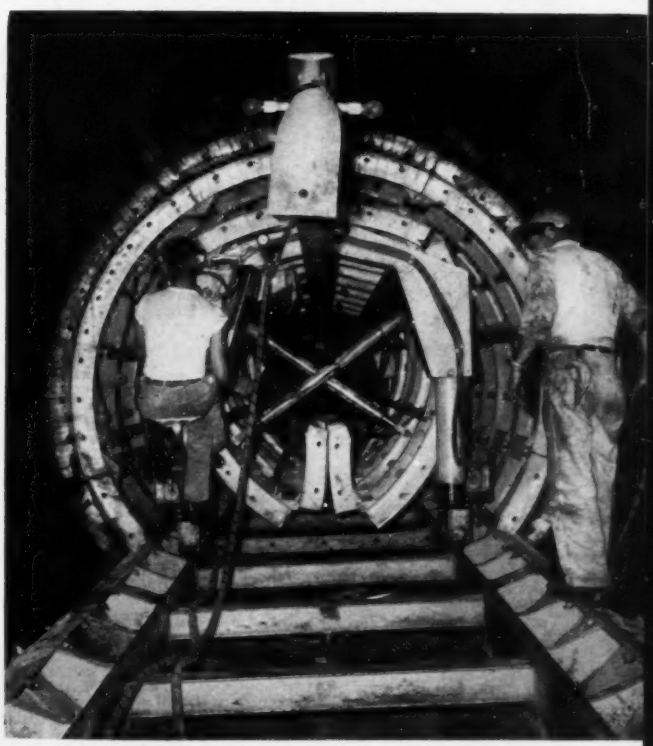
Additional rods bearing on the driven tunnel's timber lagging keep the form from shifting as concrete is poured. There are eight of these 1 3/16-in. dia anti-flotation rods to each form section; half at the springline, the rest 5 in. on either side of crown center.

Forms are handled by an hydraulically powered jumbo riding on the string of invert bridges. A Gardner-Denver 5-hp air motor drives a Commercial pump to supply oil to the jumbo's various Dinsmore rams and to hydraulic traction motors on the rear wheels.

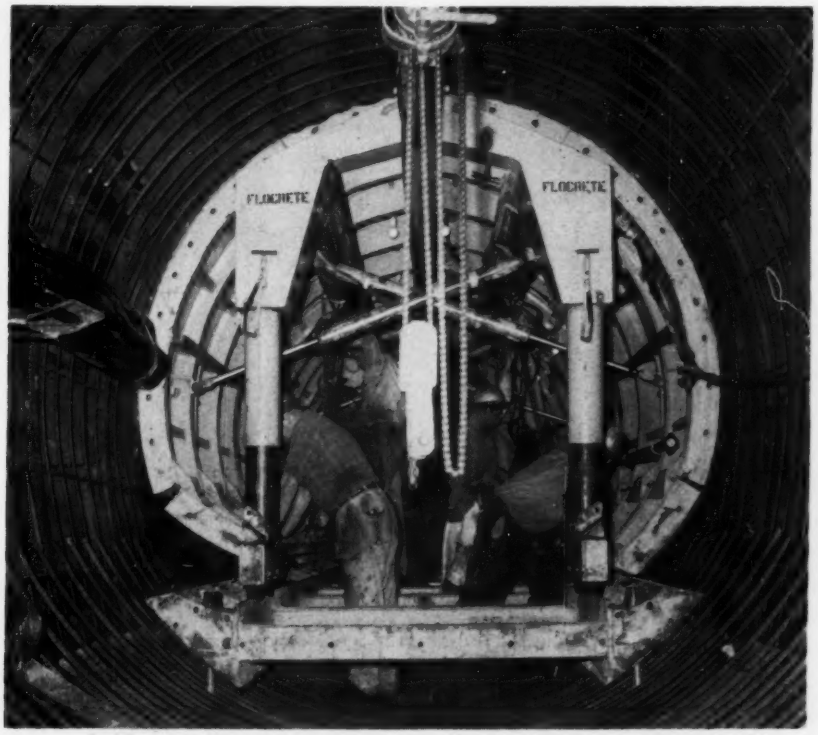
Forms are moved ahead on the graveyard shift. First an extra section of invert bridge is picked

PREPARING THE FACING—Plastic sheeting that is to be embedded in face of sewer's concrete is unrolled over the still-collapsed arch form. Rams hold side forms in.

STARTING THE MOVE—Air-operated chain hoists swing up form skirts after jumbo's leg rams raise unit to support the crown.



PASSING THE STANDING FORMS—Jumbo carries collapsed form section ahead. Jumbo's controls are centered at seat (left).



RESETTING THE FORMS—With plastic in place, jumbo's rams expand arch form. Steel bands that secure plastic sheet will be passed through skirt forms and held to bridge.

up by a Keller air-operated chain hoist on a trolley riding a 12-in. I-beam. The beam cantilevers 18 ft from each end of the jumbo to handle the bridge easily.

After placing the invert bridge in its new position, the jumbo returns to pick up a section of arch form. Rams in the jumbo legs raise the top structure to support the crown. Then pneumatic chain hoists swing up the lower skirts, and double-acting hydraulic rams swing the side forms in. With its leg rams again lowered, the jumbo moves the collapsed form through the still-standing forms to the just-set invert bridge.

Here the plastic facing material that lines the top 260 deg of sewer tunnel is placed over the form. It is held on 16-in. centers by ½-in. wide bands of steel strapping material previously stapled to the plastic. The bands circle the arch form and are fed through ⅛x¾-in. slits in the form skirts. After the jumbo (in a reverse of the collapsing procedure) sets the form in place, the bands are clamped by set screws on the invert bridge. They are cut off for

continued on page 92

(Advertisement)

All over the world, where work conditions are extra tough, you'll find dependable Cat Engines powering the job

In mud, rock, blazing heat and below-zero cold, the fine-tolerance workmanship of rugged Caterpillar* Diesel Engines keeps the job running on schedule. Wherever steady production is of prime importance, these same basic characteristics—from smooth lugging to the ability to idle for long periods—make CAT* Engines first choice for power shovels, cranes and draglines.

When Caterpillar Tractor Co. first designed its diesel, it paid special attention to durability, a trouble-free fuel injection system, and the capacity to burn a wide range of fuel. Because these features pay off on the job site, Caterpillar Diesel Engines are the keystone of the construction industry. And the fact you can count on them *not* to fail, idling down other equipment, gives these rugged power units a

Several Marion draglines, a Koehring dragline and a P&H dragline—all depend on Cat Engine power to keep the job on schedule excavating in this glacial till and sticky gumbo mud.

Shovel power is furnished by Caterpillar Diesel D375s and a D364 on construction of the Grasse River Lock on the St. Lawrence Power Project, near Massena, New York.

low *final* price the economy-minded spread owner can't afford to pass up.

Specify engine power by Caterpillar in your next shovel—or repower with a Cat Engine in a shovel that's working, but not hard enough. You can depend on the honest horsepower ratings of Cat Engines and their economy, durability, and sure-fire reliability. Your Caterpillar Dealer can show the right fit of power for any job, from the rugged D311 (65 HP, maximum output capacity) to the heavy-duty D397 (650 HP, maximum output capacity).

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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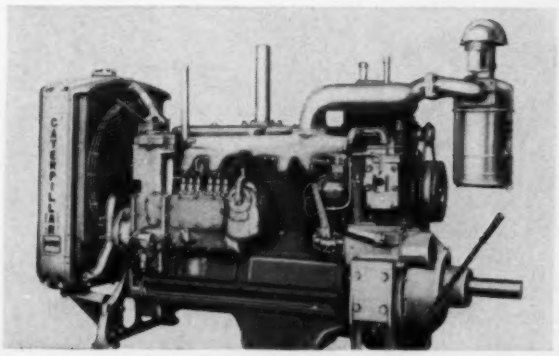
Lorain crane, handling forms for spillway on dam construction south of Mathis, Texas, is powered by dependable Cat D337 Engine. "Like that Caterpillar equipment!" says project supt. J. A. Downey (H. B. Zachry Co.). "The rest of our equipment shows we prefer Caterpillar machines for our money when it comes to moving dirt cheaply: 26 D8s; 5 D7s; 9 D6s; 5 D4s; 1 D9; 8 DW20s; 6 DW10s."



Typical of the Caterpillar line of modern, heavy-duty diesel engines is this sturdy Cat D318 Engine. Rated at 137 HP (maximum output capacity), its four-cycle design provides a smooth, effective power stroke with an efficient utilization of power. This feature, plus Caterpillar's long life and minimum of maintenance, pay off in dependable service and profitable production.

This Bucyrus-Erie shovel, working on construction of a road to the railroad bridge being built on the Northern Pacific Railroad relocation project near Cumberland, Washington, is powered by rugged Caterpillar Diesel D318 . . . "They're dependable. We don't want any trouble so we get Cat Engines!" says the job superintendent for Hamilton-Thoms, owner.

ENGINE POWER BY CATERPILLAR

Cylinder liners typical of quality in Cat Engines Full-length, wet-type liners in all Cat Engines give more efficient heat transfer — reducing maintenance costs. Direct contact of liner and coolant means you can be sure of long liner and ring life.

Dept. CM-2, Engine Division
CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Send me more information about Caterpillar Diesel Engines for prime and repowering use in the construction field. I have checked the proper box to guide your selection of material.

☐ I would like detailed information, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand I am under no obligation.

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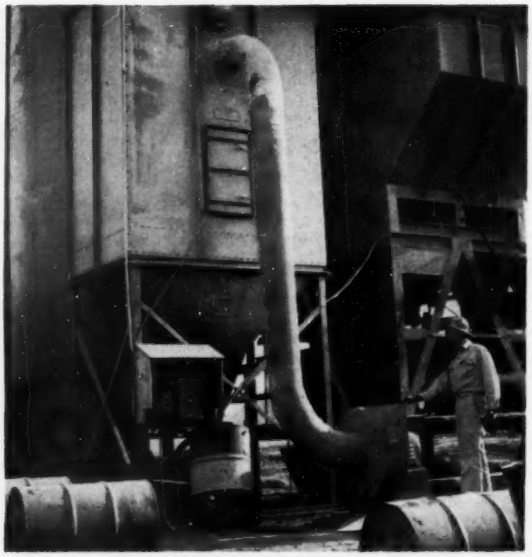
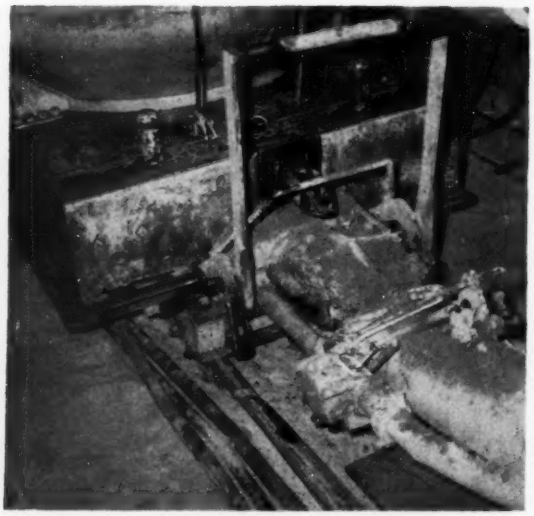
FEEDING THE BATCH PLANT—Michigan tractor shovel loads aggregates into hopper of conveyor to contractor-designed plant.



CONTROLLING CEMENT DUST—City's air pollution control regulations dictate 5-hp fan and receiving bin at batch plant.

LOADING THE PLACER CARS—After paver's bucket dumps mix into hopper, 3 yd of concrete is fed to each rail-mounted placer.



DISCHARGING THE CONCRETE—Quick coupler connects placer and discharge line and two pairs of air pipes to blow mix out.

form removal and later are ground flush with the concrete surface.

The graveyard shift sets only as much form as can be concreted on the following day shift. This averages at least eight 16-ft form sections, or 128 ft. The day shift is restricted to concreting operations to allow free access to the tunnel by the concreting trains.

Tunnel lining thickness varies from 10½ in. in the arch to 15½ in. at the invert. Concrete is a 6.4-sack mix, 4- to 5-in. slump, with Horn's Ayr-trap air-entraining admixture. While design strength is 3,000 psi, actual strength varies from 3,200 to 3,800 psi.

Maximum aggregate is ¾ in. although the placing equipment can handle concrete with larger sizes. Reason for the limitation is that the plastic facing material, Amercoat T-lock, has T-shaped ridges on the back to bond it to the concrete. The concrete, of course, must flow around these ridges.

Concrete is mixed outside the tunnel portal. Kemper Construction Co., the joint-venture member handling the lining operations, designed the batching plant. It fabricated its own bins and conveyors and installed separate Hardy weigh scales for aggregate and cement. Because of Los Angeles' air pollution control requirements, cement dust is collected in a bin fitted with a 5-hp fan.

The plant is fed by a belt conveyor whose hopper is loaded by a Michigan 175A tractor shovel. In turn, the plant drops dry batches on to a 24-in., 400-fpm belt conveyor that feeds the skip of a Rex 34E paver. The paver's bucket rides an extended boom to discharge mixed concrete into a Garbro hopper. From the hopper, which straddles an extension

MIXING THE CONCRETE—Set into hillside, highway-type paver receives dry-batched concrete from belt conveyor moving at speed of 400 fpm. Design mix is 3,000 psi.

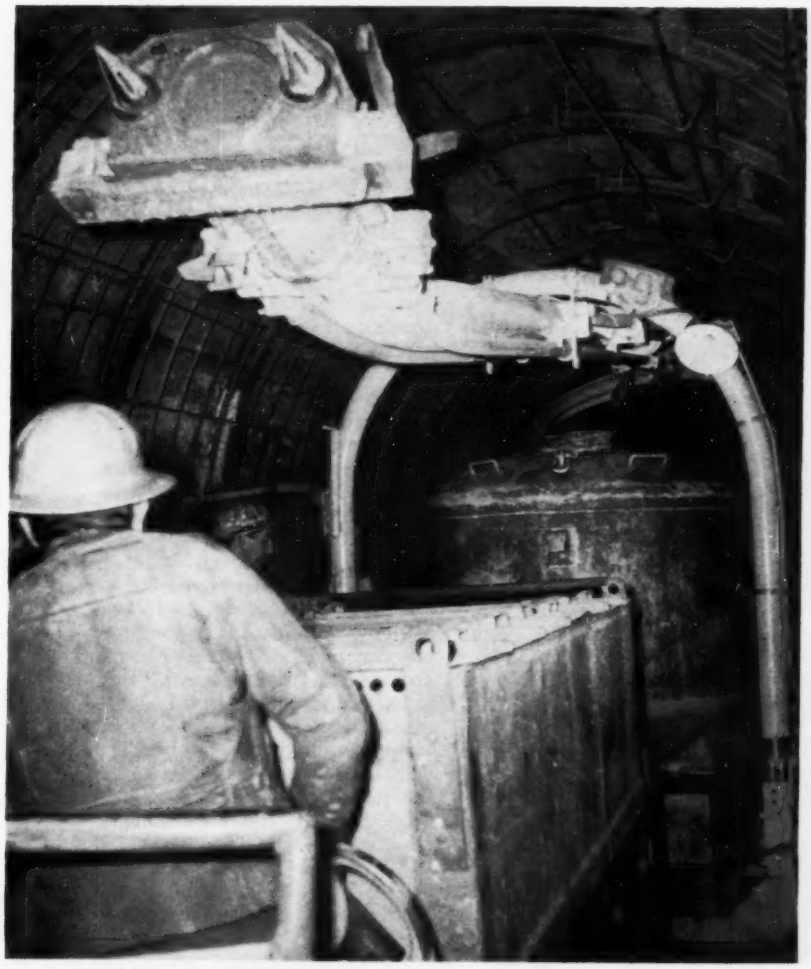
of the tunnel railroad, concrete drops into 3-yd placer cars.

Along with the forms, the key to the fast lining job is the pneumatic concrete-placing equipment. It consists of the placer cars and a discharge jumbo.

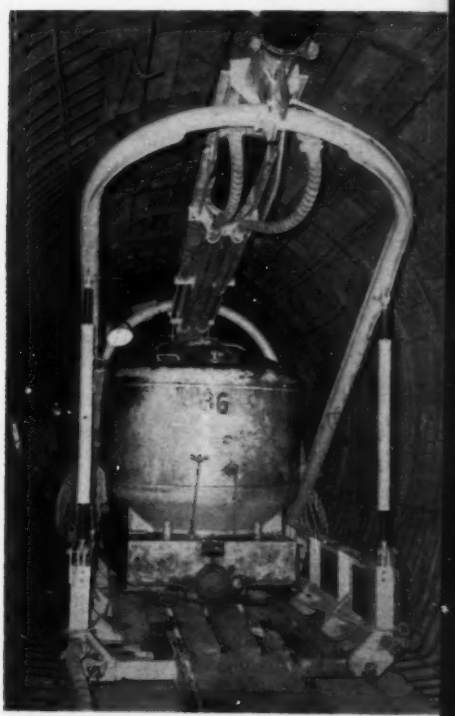
An 8-in. slick line or discharge pipe extends along the crown from the form being poured to the rear of the jumbo. Here it is rigidly attached. It also is connected by flexible hose and hinged connection to another length of 8-in. pipe. The forward end of this terminal length of discharge pipe can be raised to let an empty placer pass beneath it, or lowered to connect to a full placer.

For concreting, a Goodman battery-operated 7-ton locomotive pushes a train of four loaded placers into the tunnel and up to the jumbo. Here the end placer is attached to the discharge pipe by a quick coupler. The coupler also hooks up matching pairs of 2-in. pipes that furnish low and high pressure air to discharge the placer. (Air at 60 psi is used until concrete embeds or covers the discharge pipe in the pour. Then 110-psi air is used.)

Air is admitted to the bottom of the placer around a turnip-shaped valve. As the operator opens the



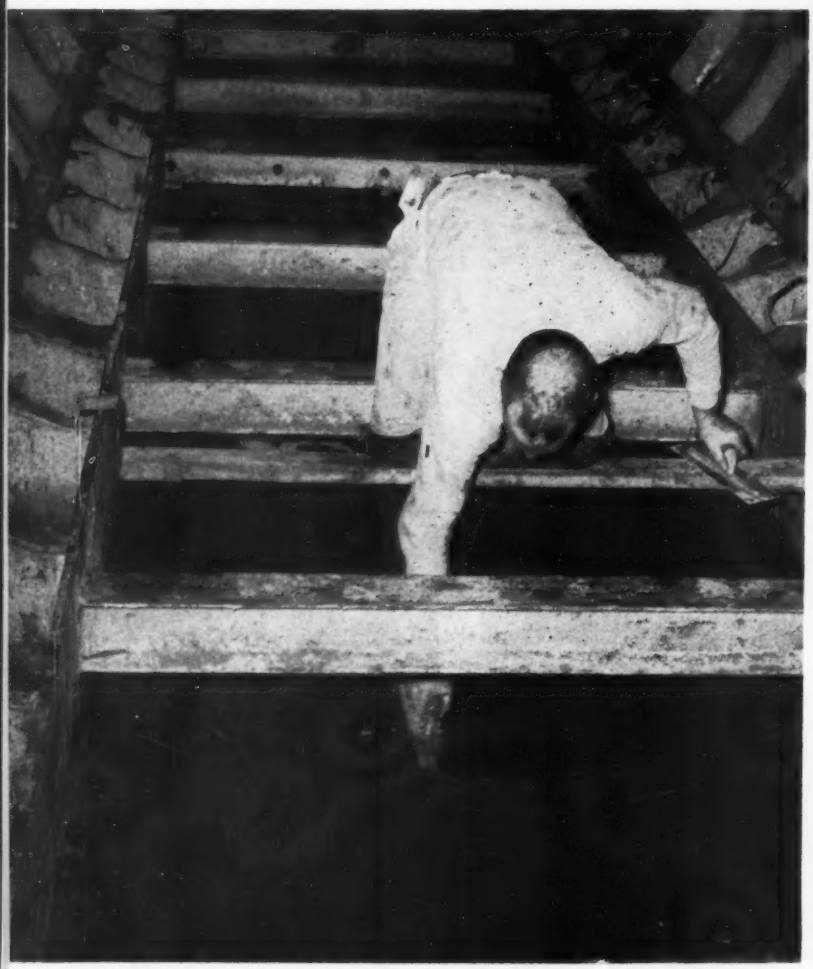
REMOVING THE EMPTIES—Locomotive pushes last empty placer of four-car train under raised end of discharge pipe to couple on to others for run out of tunnel.



PASSING THE JUMBO—Ramped tracks let empty pass before fill is connected.

CHECKING THE POUR—Workmen peer through wood bulkhead form at end of pour to see how concrete is advancing. Between them is the 8-in. concrete discharge pipe.

VIBRATING THE INVERT—Pneumatic chipping hammer shakes base form.



FINISHING THE INVERT—After concrete has partially set up, base is given a hand troweling. Note that invert bridge's support pins have been removed and set aside.

valve, air passes the valve needle and disperses to mix thoroughly with the concrete. It also forces the concrete to move through the discharge pipe. Valve opening controls discharge rate. And discharge can be stopped almost immediately on signal to the valve operator. A rubber-gasketed hatch cover keeps the placer airtight while discharging.

As the face of the concrete pour advances within the form, the discharge line is withdrawn. This is done merely by backing up the train of placer cars, the quick coupler transmitting the pull to the discharge line and to the jumbo. Between jumbo and form, the withdrawn discharge pipe is hung from the tunnel crown on U-shaped brackets of ⅝-in. round bars on 20-ft centers.

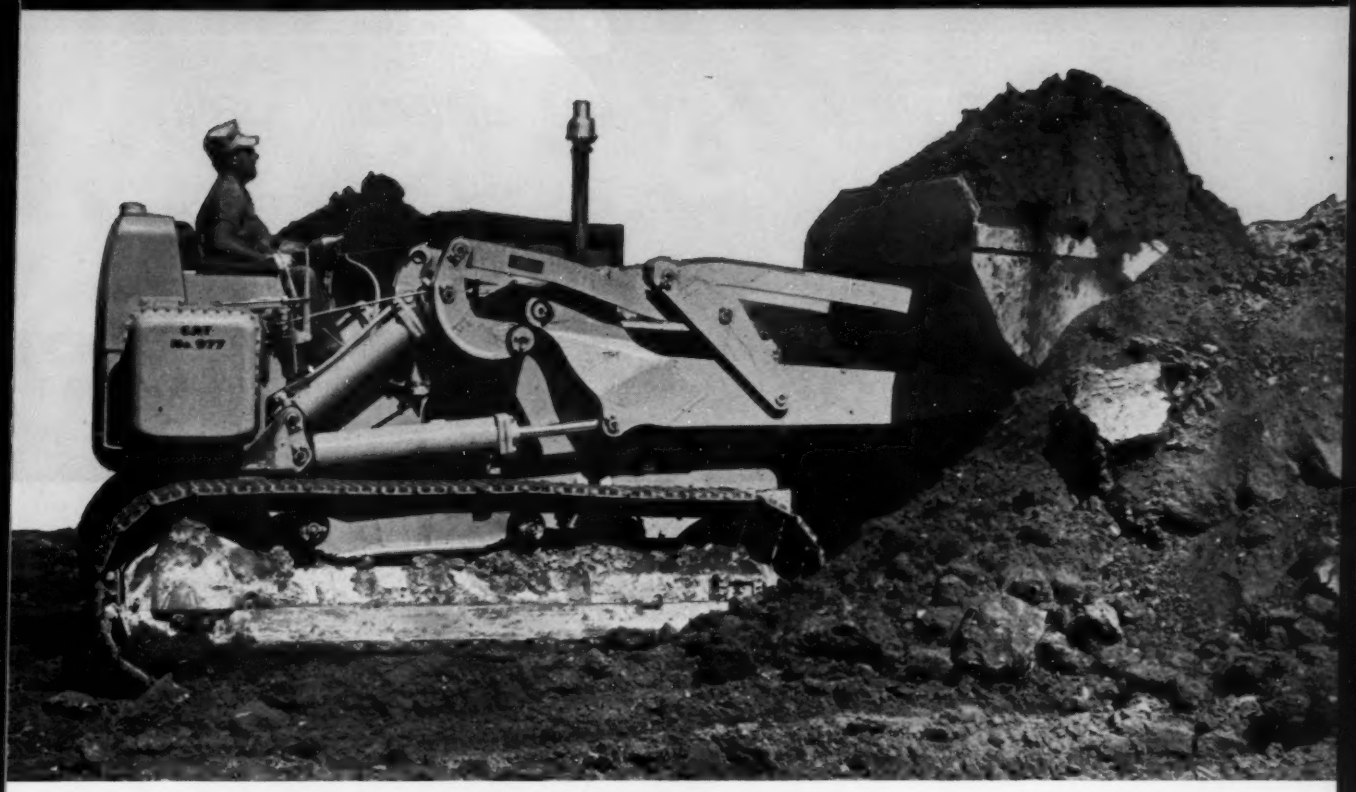
After a placer car is emptied, it is disconnected, and the end of the discharge line is raised. Two 5-in. by 5-ft air rams on the pipe, working on chains attached to the arch of the jumbo, handle this.

Then the empty is pushed beneath the pipe and over ramped tracks through the jumbo. The discharge line is again lowered, the next placer in the train is coupled to it, and concreting is resumed. (Both the placer and the discharge line are fitted with flapper valves that prevent concrete from flowing out while they are disconnected.)

During concreting, forms are vibrated by Viber pneumatic

continued on page 98

"WILL OUTPERFORM ANY MACHINE IN ITS CLASS!"



This Cat-built Traxcavator is loading out soil from spoil heap for grade fill and shoulders — loads out 10-yd. trucks, servicing 5 trucks with a 2-mile haul. Handling damp hard-pan, the husky No. 977 operates in 2nd and 3rd speeds and loads 10 yd. in 2½ min., averaging up to 2,000 yd. per 10-hr. day. The Minnesota State Highway job is 5.4 miles long and it calls for an excavation of 840,000 yd. of all classifications.

That's the way Mr. Markham of the E. Markham Construction Co., St. Paul, Minnesota, feels about his Cat No. 977 Traxcavator, shown loading out soil for grade fill and shoulders on a state highway improvement job in St. Paul.

Owner Markham feels that CAT-built equipment is the "most reliable and best mechanically." He says, "Caterpillar Tractor Co. has wisely shown an understanding of the contractors' equipment needs —no fancy do-dads that look good on paper and flop in operation—just down-to-earth improvements that really work."

Dependable, versatile performance is typical of Caterpillar's line of Traxcavators, from the rugged No. 977 to its tough, agile smaller brother, the No. 933. These finely balanced work units are engineered for the *hard* work, with welded steel frames, lift arms and cross braces of strong, box-section construction, and tilt arms of solid steel. They're easy to handle with quick-acting hydraulic controls.

The 50 HP No. 933, as well as the larger No. 955 and No. 977, are available in the new Series E, with extra-sturdy undercarriage for applications which put the greatest stress on your equipment. And the new side dump bucket can be had for the No. 955 and No. 933 Traxcavators. For complete details, see your Caterpillar Dealer. He'll be glad to talk your kind of language in a deal for the best in earthmoving equipment. And he'll back you up on expert service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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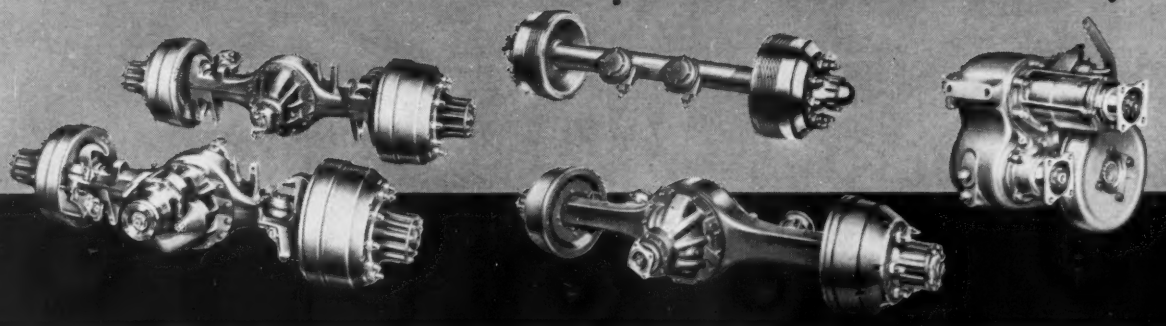
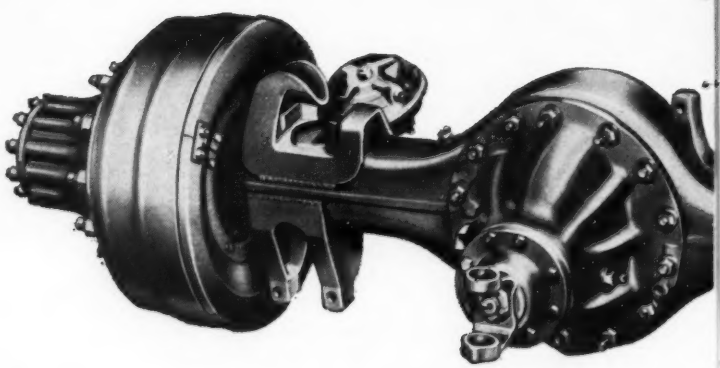
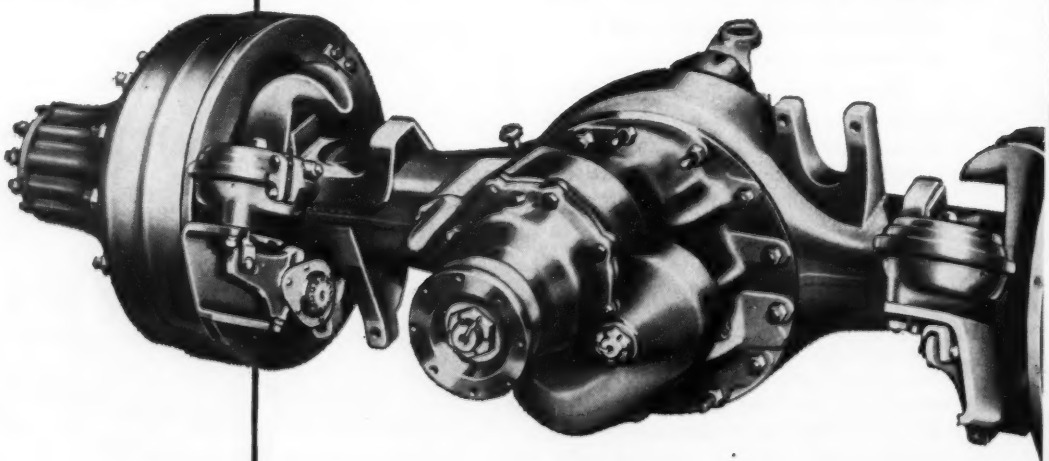


Whatever your requirements for highway or off-the-road equipment—Timken-Detroit® offers you a full line of driving, trailer and front axles . . . brakes and gear boxes . . . backed by over 50 years of manufacturing experience and proven by continuing field and laboratory research.

Proving the superiority of design, engineering features and quality that go into every Timken-Detroit product is the *Lightweight Tandem.*





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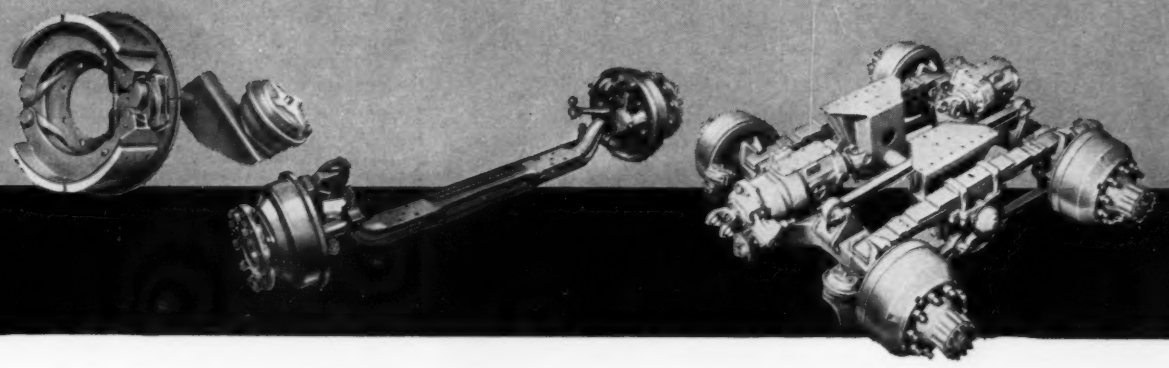
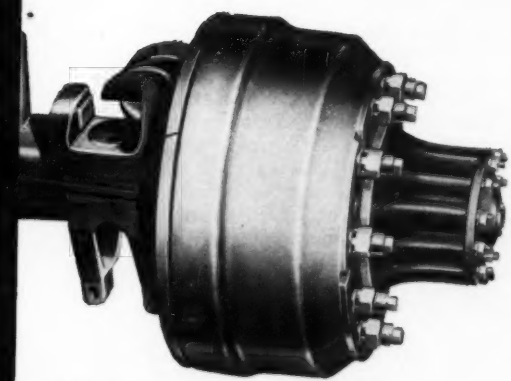
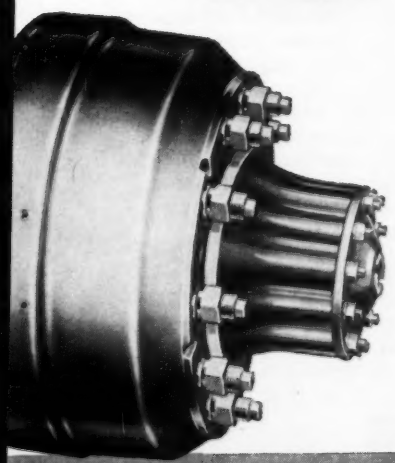


TIMKEN-DETROIT® LIGHTWEIGHT TANDEM GIVES YOU...





Greater Payload Capacity! Up to 700 pounds lighter than any other unit of equal capacity, this new tandem will give you up to 26,000 extra ton-miles payload in every 75,000 miles of operation.

Parts Interchangeability means easier maintenance. Almost all the parts in this new tandem—gears, pinions, differentials and brakes—are interchangeable with parts from Timken-Detroit standard single axles. This assures you more productive road time . . . faster, simpler, more economical maintenance . . . and smaller parts inventory.

Inter-Axle Differential divides torque evenly between axles . . . yet permits wheels of one axle to revolve faster or slower than wheels of the other axle. This means both axles are doing equal amounts of work . . . driving parts and tires last longer.

Driver-Controlled Lockout! With Timken-Detroit Inter-Axle Differential, the driver can obtain the advantages of straight-through drive under slick conditions by locking out the differential at any driving speed.

Big, Dependable Hypoid Gears rotate in correct direction for maximum gear and bearing life.

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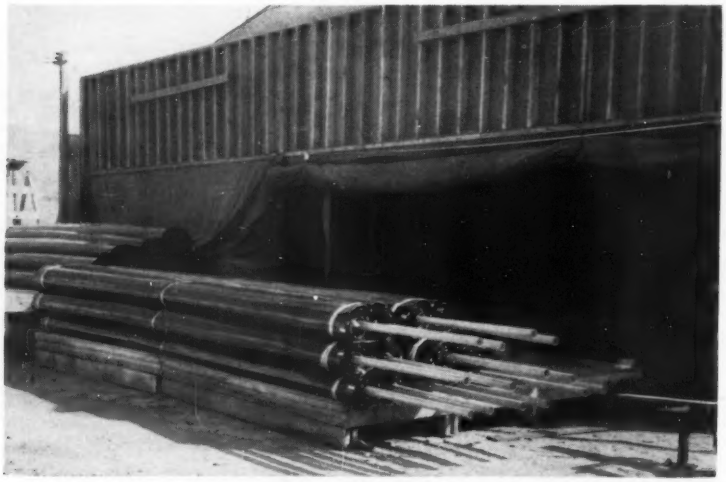
The Accepted Standard

PREPARING THE FACING—Steel banding material is stapled to sewer's plastic facing in shed near tunnel portal. Jig controls spacing of bands, which are on 16-in. centers.



CARRYING THE FACING—Plastic material is rolled around pairs of aluminum pipes to be carried into tunnel and easily unrolled down each side of form for embedment.

units clamped just above spring line. These are moved ahead as concreting proceeds. Spot vibration also is provided by an Ingersoll-Rand chipping hammer fitted with a flat-head tool, which is held against the form.

While concrete is still green, the pins that support the invert bridge are removed. The holes they leave are grouted the next day. Specs call for arch forms to remain in place 16 hr or until concrete reaches 400 psi. The latter usually governs. And, with pours starting at 7:30 am, stripping begins at midnight.

After the forms are stripped, the plastic facing embedded in the concrete must be patched. This occurs at points where the forms' anti-flotation pins have pierced it, at ring joints between adjacent plastic sheets, and at inspection ports where patch sheets were placed just before closing the port. Because the plastic softens with heat, it is easy to fusion weld a patch over joints and pin holes.

The tunnel lining work is on a three-shift basis, with each shift used for a different purpose. Most of the reinforcing steel is placed on swing shift—the design calls for 175 lb of reinforcing per ft of tunnel. There are four separate curtains of reinforcing, including invert steel on 4½-in. centers. Because there is only so much room to work in the tunnel, not all of the reinforcing can be placed on the swing shift; some of it is placed on the graveyard shift. All other materials—such as the plastic lining—except concrete are brought in on the swing shift. The three shifts require about 53 men total.

Air supply in the tunnel comes from a 600-cfm Ingersoll-Rand compressor located outside. It is piped to the work by 6-in. seamless steel pipe with Victaulic couplings. Ventilating air is pushed down into the tunnel from a mid-point shaft by a 3,000-cfm blower. But the holed-through tunnel itself produces a natural draft.

Lining the 4-mi tunnel began at the mid-point and worked toward the north portal. When that half was completed, operations were shifted to the south portal, where work is now nearly done.

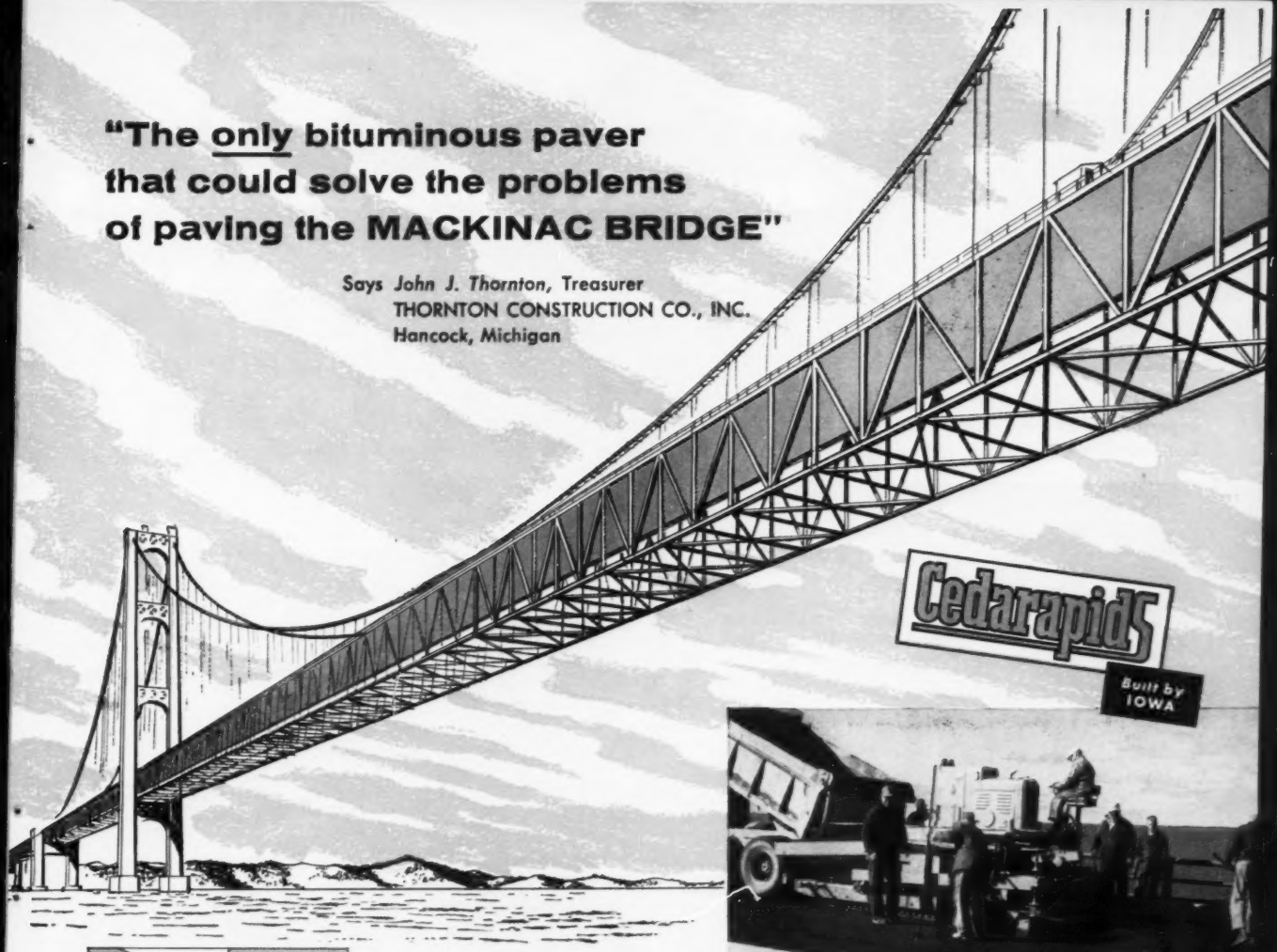
The project is being done for the City of Los Angeles Board of Public Works, of which Cushing Phillips is president. Design was by Hyperion Engineers, a joint venture of Holmes & Narver, Inc.; Daniel, Mann, Johnson & Mendenhall; and Koebig & Koebig; with David L. Narver, Jr., as project manager.

Contractor Arundel - Dixon-Kemper is a combine of Arundel Corp., L. E. Dixon Co., and Kemper Construction Co. R. B. Kemper is project manager on the tunnel lining work, and Joe De Milita is superintendent. John Witte, chief engineer of Kemper Construction, laid out the equipment spread.

The concrete placers were developed by M. F. Kemper and are now made by Flocrete Manufacturing Co. The contracting combine leased the placing equipment for the job from Flocrete, who also designed the forms and the form jumbo.

"The only bituminous paver that could solve the problems of paving the MACKINAC BRIDGE"

Says *John J. Thornton*, Treasurer
THORNTON CONSTRUCTION CO., INC.
Hancock, Michigan



Cedarapids

Built by IOWA

Paving around scuppers, railing posts and expansion joints was a difficult problem on the Mackinac Bridge roadbed paving job, according to Thornton Construction Co., one of the leading contractors in Michigan and surrounding areas.

The 80 expansion joints used in the structure had lips extending 1½" above the concrete floor, which had to be flush with the finished bituminous surface mat. This problem was solved by Thornton's Cedarapids Bituminous Paver, which laid a smooth, even surface up to and away from these joints without excessive hand labor.

Says John Thornton, "We are very well sold on this machine as being the only machine that could have done this job. The roller path is very ingenious and was very helpful in our successful completion of this project."

Here is another instance where the "new concept of bituminous paving", exemplified by the exclusive features of the Cedarapids Paver, saved time and money for the contractor.

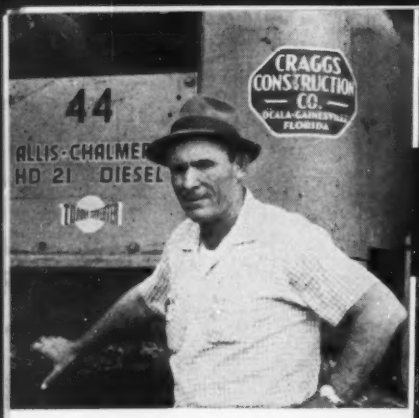
Write for complete information, or ask your Cedarapids Dealer about the profit-advantages of a Cedarapids Bituminous Paver on your next job.

(Above)—Note the expansion joint jutting from the concrete bridge floor in the foreground. Then note the smooth, even bituminous surface on either side of the joint in the paved lane.

(Below)—The exclusive Cedarapids oscillating rollers permit the crawler tracks to pass over the 1½" lips of the expansion joints and still keep the paving screed on a level plane.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.



J. C. Lavender, project superintendent for Craggs Construction Company.

"OUR ALLIS-CHALMERS

Forty Five motor grader puts finishing grade on roadbed. Notice how the ROLL-AWAY moldboard keeps load live and rolling.

Big, powerful HD-21's clear right-of-way and level fill. Torque converter drive makes big production easy for operator . . . easy on tractor and equipment.

FLEET HELPS US BID LOW

...finish the work on schedule"

. . . that's what J. C. Lavender, superintendent for the Craggs Construction Company, Ocala and Gainesville, Florida, says about his company's Allis-Chalmers fleet.

Craggs Construction Company was awarded a 14½-mile job on Florida State Route 207, an important farm-to-market road in the heart of the potato growing area. The contract called for widening, filling, straightening out several sharp curves, and constructing a large number of drainage ditches.

Here are the Allis-Chalmers machines that did the bulk of the work: 4 motor scrapers, 4 motor wagons, 13 crawler tractors, 4 pull-type scrapers, 5 motor graders.

This Allis-Chalmers fleet moved approximately ½ million cubic yards of material from 5 borrow pits for filling and stabilizing. Almost 200 acres of land were cleared and grubbed by bulldozers as the right-of-way was widened to accommodate a 24-foot pavement with 8-foot shoulders.

Whenever you have to move dirt in a hurry — on large jobs or small — investigate the many reasons for going Allis-Chalmers. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

ROLL-AWAY is an Allis-Chalmers trademark.

Forward forced ejection and high apron opening provide fast, clean, unobstructed dump and smooth, controlled spread. This keeps fill area in good operating condition . . . contributes to better compaction.

Curved cutting edge and offset center bit of Allis-Chalmers motor scrapers mean no corner voids . . . a full payload every trip.

FORM SUPPORTS—Contractor Gibbons and Reed drives stakes at 10-ft intervals to exact finish grade and builds concrete pads around them to support the paving forms.

Forming Precision Saves on Grinding

CONCRETE PADS, built to support paving forms at exact finish grade, pay off in construction of airfield runway pavements to tight Air Force smoothness specifications.

Gibbons and Reed of Salt Lake City, Utah, devised the method to meet the tolerance of ⅛ in. in 16 ft called for by the Air Force specs. They have used the method with success on six runway jobs designed by the Corps of Engineers for the Air Force.

Latest of these projects, involving reconstruction of a runway at Geiger Air Force Base near Spokane, Wash., was completed three weeks ahead of schedule.

Here's what the contractor did. After preparing the subgrade in 25-ft-wide paving lanes, he set pins at 10-ft intervals to the exact finish grade. A 12x14x4-in. concrete pad was then placed around the pin to hold the forms at proper grade. A layer of frost-free sand about 2 in. thick provided continuous support for the forms between the pads.

After concrete placement, the finishing crew touched up behind the paving train with special floats made of aluminum tubing with 25-ft handles. Then the surface tolerance was carefully checked with 16-ft-long straight edges. At least one check-point in every 4 ft of slab insured proper grade. Tenant grinders brought down occasional high spots, which occurred mostly along the longitudinal joints.

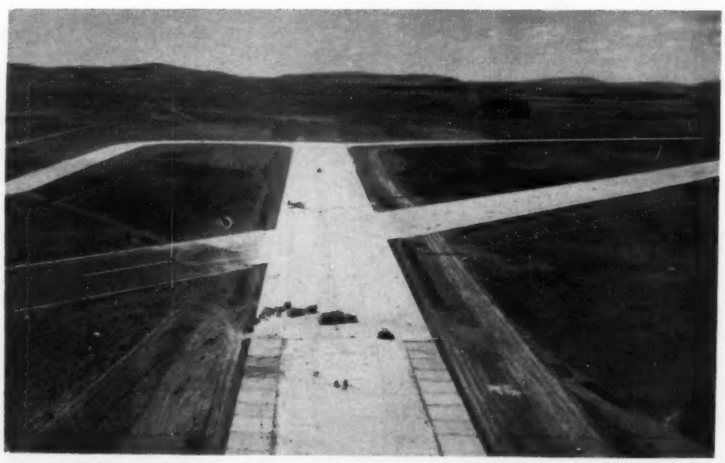
Howard Woods, project manager for Gibbons and Reed, said that 99% of the pavement surface was within tolerance after finishing and needed no grinding.

The $2.5-million contract included removal of an existing runway, placement of a new 9,000-ft concrete runway 150 ft wide, and construction of 2,200 ft of taxiway 75 ft wide together with a 600x300-ft holding apron. Runway pavement is 12 in. thick except for a 1,000-ft section at each end which is 13 in. thick. Altogether the job involved placing 63,600 cu yd of concrete and 150,000 cu yd of gravel base. Excavation totaled 700,000 cu yd.

First item on the schedule was removal of the existing 6-in.-thick concrete runway. The contractor also removed undesirable subbase material to a depth of 9 ft. Then he placed selected borrow up to 33 in. below the finish grade. Next 17 in. of minus 4-in. selected base course, topped with 4 in. of 1½-in. crushed gravel, was placed and compacted to 100% density by modified AASHO standards.

The paving train consisted of two 34E dual drum Rex pavers, a Blaw-Knox spreader with 11 vibrators, a Blaw-Knox transverse finishing machine, and a Koehring longitudinal float. After the finishing process, a burlap drag gave the pavement a rough texture. Following a 24-hr curing period with wet burlap, the contractor sprayed white-pigmented curing compound on the slab.

Other Gibbons and Reed supervisory personnel on the job were William S. Gear, field engineer; William G. Kirkham, office manager; and Ed L. Jolley, superintendent. The project was built under the supervision of the Seattle district, Corps of Engineers.



FIRST SECTION—Early completion of this 2,000-ft section makes it possible for planes to use the intersecting runway while the rest of the new runway is constructed.

The SP-107 is fully convertible to shovel, crane, dragline, clamshell, or hoe.

the fast little rig with big ideas...

LORAIN SP-107

This economical, fast, maneuverable, "go-anywhere" Lorain SP-107 can tackle any kind of a construction job. It can speed down the highway, walk into the job with 4-wheel drive, backed up with lugging power, high tractive effort, and big, tubeless tires—and go to work anywhere on a maximum capacity basis without setting outriggers.

This new, 3/8-yd., 7-ton excavator-crane is ideal as a "one and only" tool for the small contractor, or as a "handy-andy" on big construction jobs. The simplicity of this low-cost Lorain makes it easy to maintain — its hydraulically operated controls make it easy to use—and its 4-wheel steer, 4-wheel drive maneuverability will present exciting possibilities to you. A demonstration will convince you that the Lorain SP-107 really is the "fast little rig with big ideas" that pays off in profits. Your nearby Thew-Lorain Distributor can arrange to show you one at work.

Highway miles click off rapidly at the 15 m.p.h. travel speed of the SP-107. It gets to the job fast—on long or short moves.

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

THEW **LORAIN**®

Since 1903...

PARTNER IN PROGRESS

to the DIESEL INDUSTRY

CATERPILLAR—one of the leading engine manufacturers using Perfect Circle chrome rings built to its exacting specifications for both original equipment and service requirements. CAT® dealers can provide you with these genuine parts.

PERFECT CIRCLE PISTON RINGS

EXCAVATING—Clamshell digs spoil through open top steel box that braces walls of trench 20 ft deep on Springfield, O., sewer job. Box walls are framed of 3 and 6-in. dia pipe.

back of the box remains open to permit backfilling over pipe as work progresses forward.

Haddad's job calls for the placing of 4,250 ft of reinforced concrete sewer pipe in trenches 20 ft deep. Nearly 2,400 ft of this requires 90-in.-dia pipe with 8-in. walls reinforced for added strength with two concentric cages of heavy gage steel welded wire fabric. Balance of the line gets 84-in.-dia steel fabric reinforced concrete pipe.

A Marion shovel starts a trench section by scooping down nearly to grade. The box then is dragged by crane over runners at the bottom of the excavation into place. A clamshell on a Lorain crane excavates the trench through the box to its final 20-ft-deep grade.

Pipe sections then are lowered by crane into the trench. A workman holding a line guides descent of the pipe sections while the job foreman directs the crane operator.

Each pipe is manufactured with lifting holes for eye bolts that simplify and ease handling the huge 11-ton sections. Once the

Steel Box Braces Deep Trench

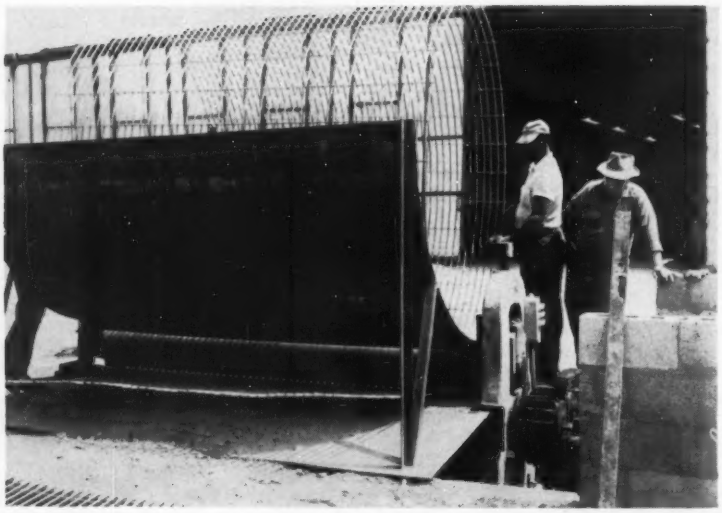
A STEEL BOX that slides ahead on runners makes a handy device for shoring a deep trench while pipe is placed.

Haddad Construction Co. of Columbus, O., built the movable shoring box to speed pipe laying in trenches where a substantial amount of timber shoring otherwise would be required. Haddad now has the box at work on a $500,000 Springfield, O., sewer job.

Two sides of the box are covered by a skin of ⅜-in. sheet steel framed by 3 and 6-in. dia steel pipe. These side walls protect workers against cave-ins and slides as they set and place 8-ft sections of reinforced concrete pipe. Front of the box is closed in by planking also as protection against cave-ins and spills in the direction of the pipe laying. The

PLACING PIPE—Lorain crane swings 8-ft, 11-ton pipe section into place in trench while workman (right) withdraws gage that measures depth of grade at bottom of the trench.

BACKFILLING—Caterpillar D6 bulldozer pushes fill over pipe. Back end of the box is left open to permit backfilling without interrupting excavation and pipe-laying.



REINFORCING—Price Brothers Co. fabricates two concentric cages of steel wire butt-welded together to form a continuous circular cage that will reinforce the concrete pipe.

pipe is placed, the eye bolt is removed and the hole plugged and sealed.

The clamshell then backfills behind the box. Designed by Said Haddad, president of the firm, the box considerably speeds pipe installation but proves adaptable to deep trenches for all purposes.

The new sewer facility will serve the Wheldon District of the city. The line will drop 13½ ft in its nearly mile-long run to a sanitary interceptor that leads to a sewage treatment plant.

Haddad's contract amounts to $510,000, about half of which will go for the concrete pipe furnished by Price Brothers Co. of Columbus, O. Price casts and delivers an average of twelve 8-ft sections daily.

Richard Haddad is job superintendent.

ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **Silva & Hill Construction Co.**
Los Angeles, Calif.

5,000 hours at 2,000 rpm before overhaul

Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before major overhaul. Says Maint. Supt. H. C. Basinger: "We've got 39 diesel-powered machines working to beat a one-year deadline. Any unexpected delay costs plenty. That's why we stick with 'DELO'. It's proved it will keep equipment rolling longer without engine breakdowns or repairs."

Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."

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- Oil stays on engine parts—hot or cold, running or idle
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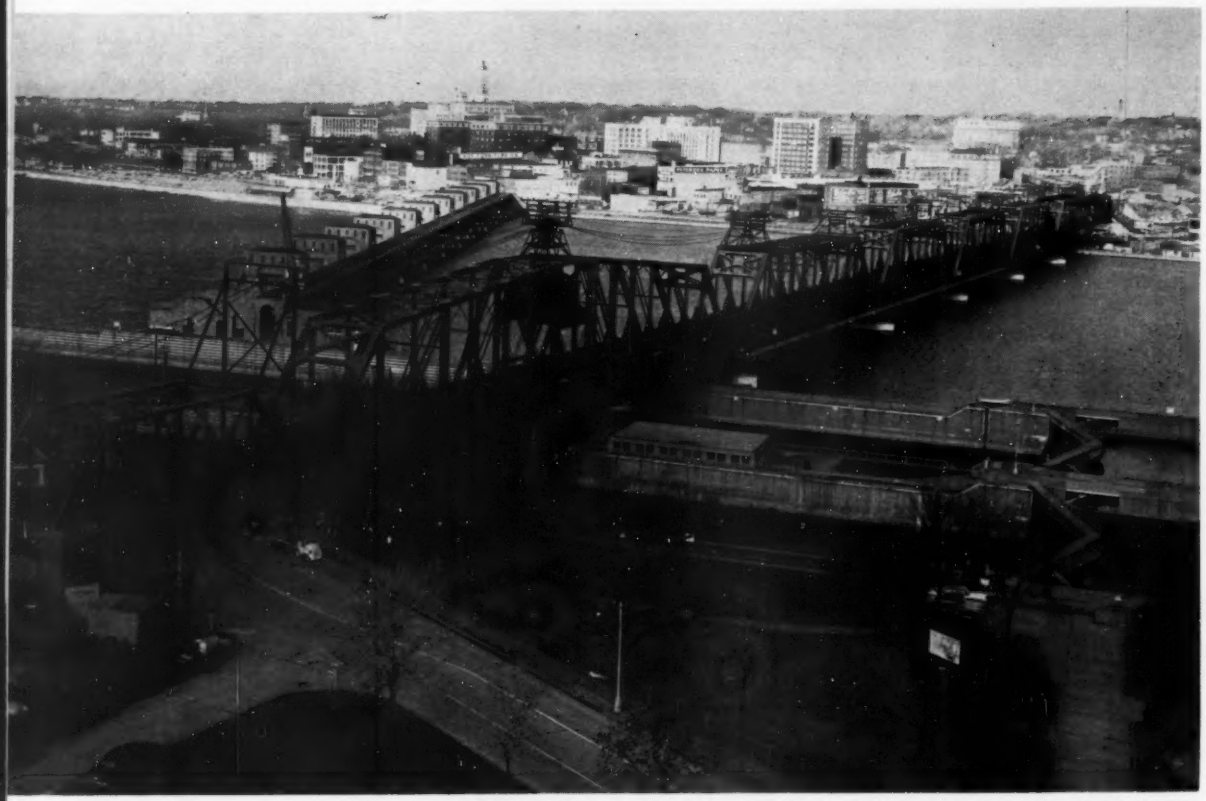


NEW METHODS—Tried and true construction techniques for the most part helped build this bridge over the Mississippi River. Its repair called for the invention of new ones.

Repair of Old Bridge Proves

By MAHON J. PLUMB and CHARLES E. BRANSON
Plumb, Tuckett and Pikarsky, Consulting Engineers, Architects
Gary, Indiana

REPAIRING A BRIDGE sometimes is tougher than building it in the first place.

When you build a bridge you draw for the most part on known techniques. But when you repair one you often have to invent the methods to do the job.

This was the case in a $1.7-million rehabilitation of the U.S. Army Corps of Engineers' 60-yr-old bridge over the Mississippi River between Rock Island, Ill., and Davenport, Ia. A pin-connected, eight-span steel structure 1,850 ft long, the bridge carries a 24-ft roadway below the double-track main line of the Chicago, Rock Island and Pacific Railroad. It needed extensive repair.

- A total of 30 worn connecting pins had to be replaced without collapsing the span.
- Truss eyebars had become so loose over the years as to be almost inactive and had to be tightened.
- The bridge's shore span had moved because of slipped abutment cap stones and had to be reset to its proper location.
- Stringers had to be strengthened and the roadway rebuilt with concrete-filled steel grid.

All repairs had to be made without interrupting a daily 30 passage railroad traffic. That called for some close planning between the Corps of Engineers, contractor F. K. Ketler of Chicago, consultants Modjeski and Masters of Harrisburg, Pa., the railroad authorities, and ourselves.

To prevent the pin-connected spans from collapsing when the worn pins were removed, spans temporarily were supported on falsework towers placed in the river. Each tower consisted of four steel H-piles about 32 ft long framed together at the top with steel beams which carried jacks. Towers were placed 22 ft apart under the spans.

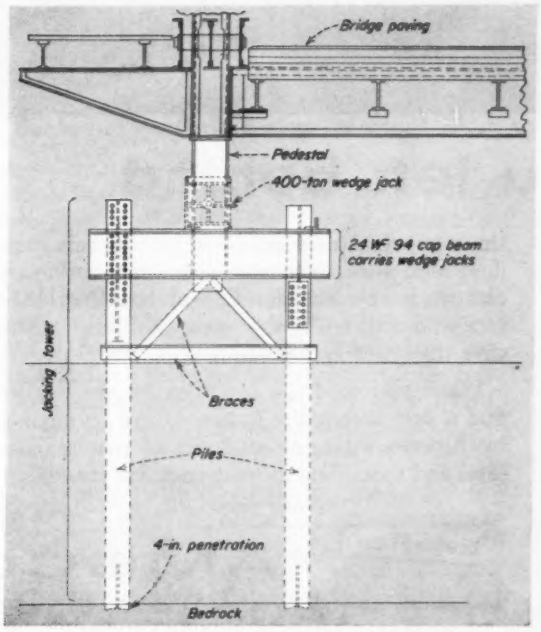
To drive the piles, a floating templet was mounted on three timber pontoons 2 ft wide and 16 ft long. These were placed parallel to one another 1½ ft apart. Pairs of angle beams bolted transversely over the pontoons provided centering for setting piles for each tower on a 4x7½-ft pattern.

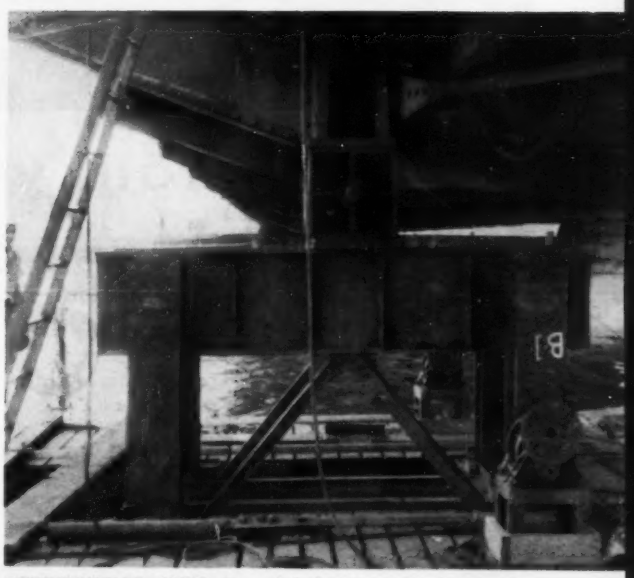
After floating the templet into position under a span, it was anchored into place with guy wires to the bridge piers on either side of the span.

continued on page 112

PIN REPAIR—To support river spans while replacing worn pins, contractor drives steel pile towers into the river bottom from which he jacks spans clear of piers.

Tougher Job Than Building It





SCREW-WEDGE JACK—Unusual jack set over each tower cap holds bridge span securely in position during pin repair.

the profit you left behind

There it lays in the dirt. Your machines and equipment ground off in the grit, pounded off in the rock. You can almost see the wear that shut down your machines too soon . . . idled your men too long . . . bled your profits too much.

Is there *one* material, *one* metal that can stop this excess wear waste?

One? It takes many alloys, engineered alloys (some you may never have heard of). It takes a list of Amsco® Alloys to span the entire range of wear applications.

Amsco Alloys that can work a full shift where severe abrasion knocked out toughest metals in three hours. Amsco Alloys that can belt rock all day, and work tomorrow, too. Amsco Alloys that can work any abrasion-impact combinations you face and still resist the wear, stop the waste . . . save the profit in the job.

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New power-tilting dozer outworks heavier rig costing $1900 more!

Otis Hilmer, veteran, Dysart, Iowa, soil conservation contractor, learned "the hard way" that *it pays to own the newest and best* in heavy-duty crawler equipment. Eleven months ago he laid out a heap of cash for a complicated "multiple-use" dozer — only to find it *didn't* hold up, and wouldn't do the job claimed by the dealer. Says Hilmer, "If I had *three* hands, I might have been able to operate it at a profit."

After fighting the heavy, cumbersome machine for over 7 months, Hilmer decided to trade it for a modern *higher-speed* Case TerraTrac Model 1000 Bulldozer, with easy-working hydraulic controls, and *exclusive power-tilting blade.* "Now," he says, "I can bid lower, handle twice as much work, and still feel fresh at the end of each day."

Comparative performance records

On a recent rural land improvement job — which constitutes the bulk of his contract work — Hilmer's 100 HP Case TerraTrac dozer *grubbed-out 40 trees, ranging up to 18" in diameter, in just 2½ hours* — 100% faster than he figures could have been done with his former rig, which cost $1900 more. He also leveled and finish-graded a 1½ by 2-block area for a new school *10 hours ahead* of his former working schedule. "And that's not all," adds Hilmer. "This Case TerraTrac tilt-dozer *cuts terraces, fills gullies, builds dams and waterways, in half the time and with about 90% less physical effort!*"

Why not let your nearest Case Industrial Dealer demonstrate this powerful, easier-handling dozer on your job *soon.* Also ask about the new Case financing plan — with convenient "skip payments" — which lets you *buy now and postpone major payments 'till later.*

Here's why the Case® TerraTrac® "1000" does twice the work with 90% less effort!

1. 100 HP Diesel, plus torque-converter drive, develops up to 24,000 lbs. pull or push, for moving bigger loads without stalling.
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4. Torsion-bar track suspension "smooths-out the bumps" . . . maintains better traction on both tracks . . . makes it easier to start bulldozing on uneven ground.
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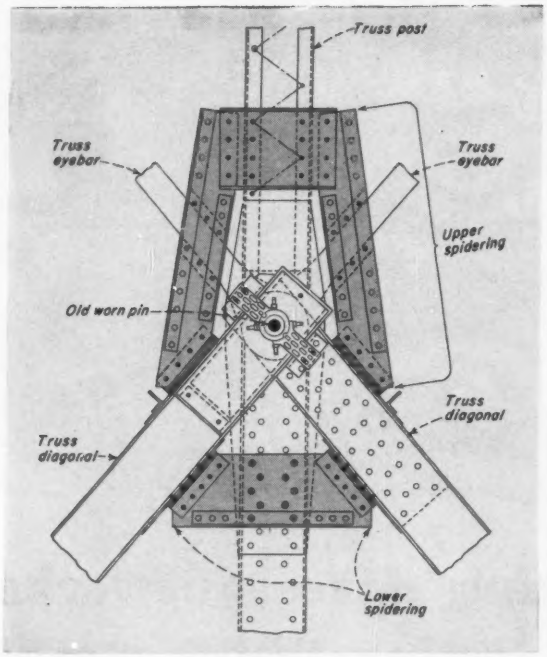
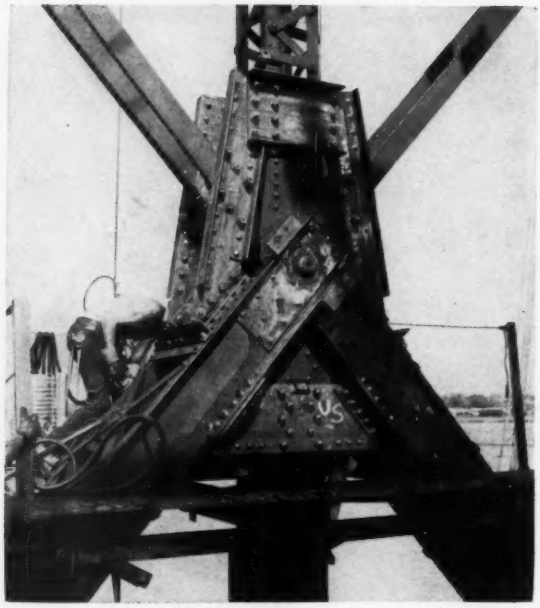


SPIDERING—Unusual structural framework called spidering erected around each joint where a pin is to be replaced holds all truss members in position. Spidering is a gusset plate made up from steel channels, plates, and angles.



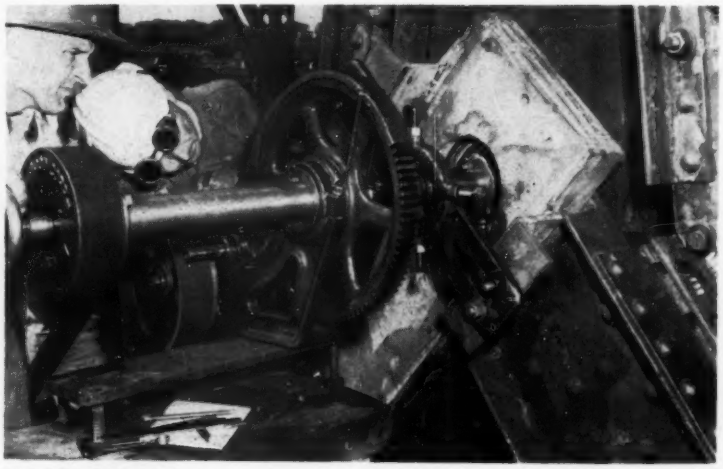
REPAIR OF OLD BRIDGE...
continued

A Lima crawler crane mounted on a 30x100-ft barge then was floated in alongside the templet to drive the piles. The crane lowered a 32-ft, 14WF84 steel pile through temporary openings in the roadway and on through the templet.

Driving Piles

Just 7 ft of silt and sandy clay overburden rested on soft sandstone at the river bottom. This did not provide enough hold for the piles. With a McKiernan-Terry No. 7 double-acting hammer mounted on the crane, a pile was driven with light rapid blows —so that it acted like a star drill —until it penetrated the sandstone to a depth of 4 in. Four piles per tower were driven in this way.

Each pile cluster was capped with sections of 24WF94's bolted to the piles with ⅞-in. high strength bolts. Field welding additional braces and diaphragm plates gave added strength. Finally, a 400-ton screw-wedge jack was lowered by crane over the tower to raise the span slightly, relieving it of its live load. Four to seven towers were used on each span. The number varied depending on the river bottom.



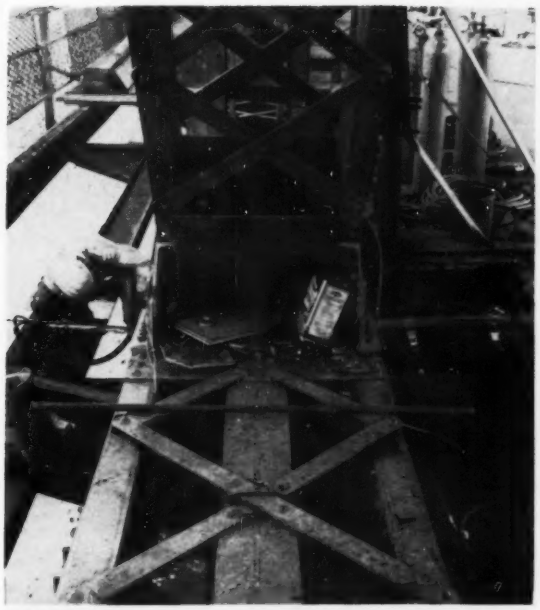
THE BORER—Portable H. B. Underwood cylinder boring bar enlarges hole diameter about ¼-in. with each pass. Finishing cut provides maximum clearance for pin of 1/32-in.

Spidering Holds Truss Members

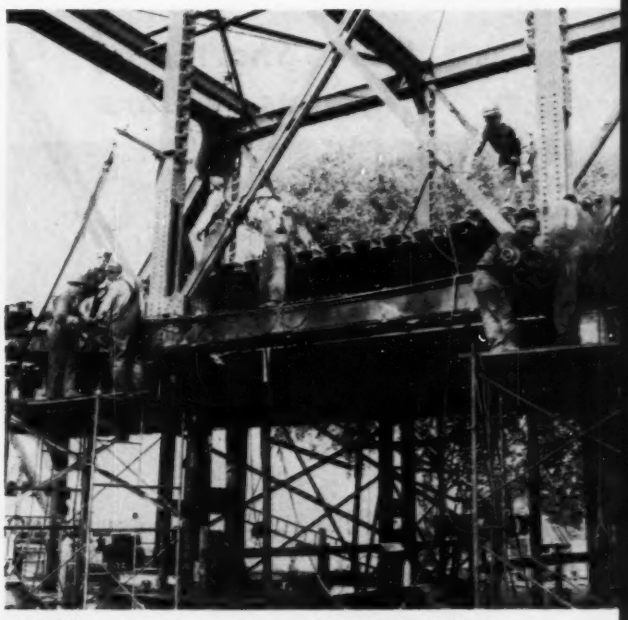
An unusual structural framework, called spidering, was erected around each joint where a pin was to be replaced. Pieces of channels, plates, and angles forming the spidering were designed as a sectionalized gusset plate to hold all truss members in proper position during reboring operations. Six bolts clamped each eyebar, and bolts connected the spidering to holes in other truss members.

Spidering bolts were left loose during jacking and centering operations. During a slack period between train movement on the bridge the span was jacked to a no load position. Before removing any pins, positive proof of falsework stability was obtained by allowing trains to cross the span.

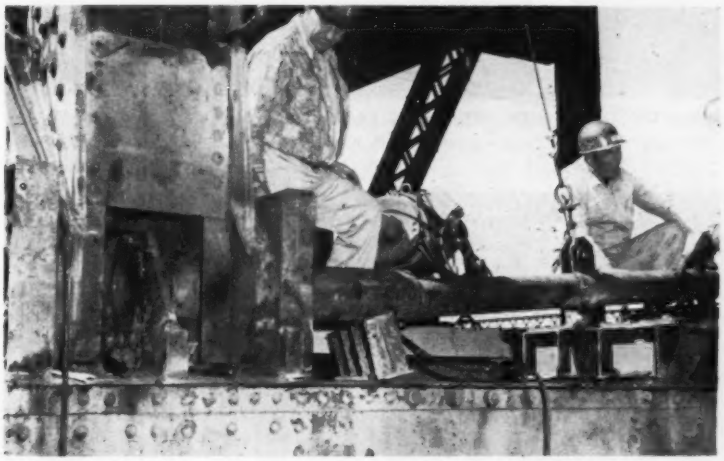
After again stopping all traffic, a final centering adjustment was made by wedging and shimming truss members at the pin and raising or lowering jacks. All spidering bolts then were tightened.



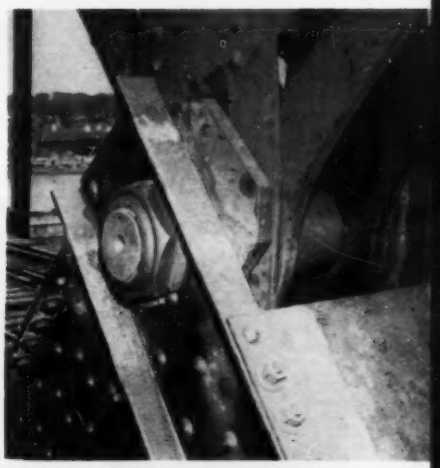
BURNING—Each old pin is burned into four or more pieces by acetylene torch and removed from the hole needing reboring.



REBORING—Two boring machines work simultaneously. Three complete sets of machines on job guard against loss through breakdowns.



TEMPORARY PIN—When reboring could not be completed in six-hour work day, a temporary pin inserted in the hole overnight holds truss members rigid so trains can pass.



NEW PIN PLACED—New pin diameters vary from 6½ to 10 in.

The old pin was burned into four or more pieces by acetylene torch and removed before starting reboring. These old pins had worn as much as ½ in., and the pin holes had enlarged. These pin holes were bored larger with a special boring machine.

A portable cylinder boring bar made by H. B. Underwood Corp. of Philadelphia did the actual reboring. Minor alterations to the machine modified the frame to adapt it to the operation. An electric motor acting through a gear train rotated the 6-ft-long, 2½-in. dia bar. A hand wheel on one end of the bar advanced the cutting tool along the hole. A cross-head plate with an adjustable bearing for centering and holding the bar at both ends of the hole was bolted to clip angles on a truss member.

Each pass of the cutter enlarged the hole diameter about ¼ in. The finishing cut provided a maximum clearance of 1/32-in. over the new pin diameter. New pin diameters varied from 6½ to 10 in. They replaced old pins of 6 to 9 in. dia.

A slight rescheduling of one train provided a six hour work day for the actual reboring. Sometimes reboring a pin hole could not be finished in the six hours and had to be discontinued overnight to permit traffic on the bridge. When this happened complete safety was assured for the trains by inserting a temporary pin in the partially rebored hole.

Upon completing reboring the next day, a permanent pin was installed, and the spidering was moved to the next similar joint.

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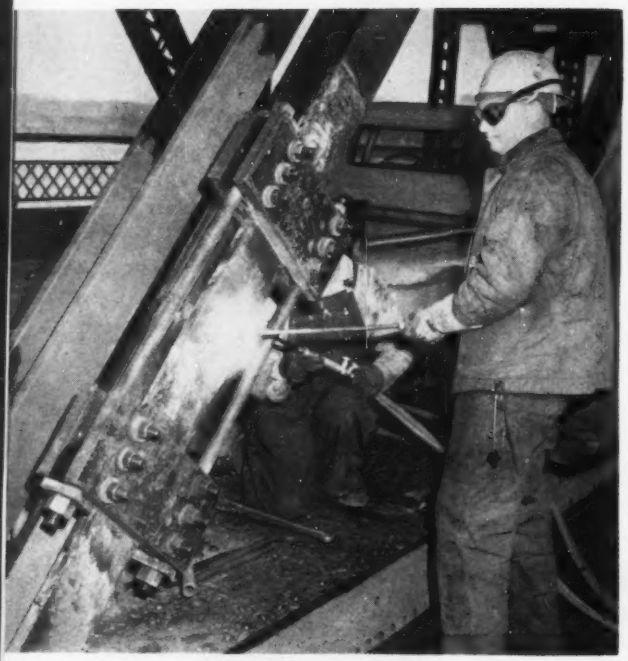
Flame Shortening Tightens Eyebars



HEATING EYEBAR—Workman applies 1,600-deg heat with acetylene torch to 1-ft-section of eyebar needing retightening.

SHORTENING EYEBAR—While heating continues, second workman tightens torsion bar causing heated section to upset slightly.

COOLING EYEBAR—As eyebar cools workmen tighten torsion bars further. Brackets and torsion bar on either side of heated length combine to support dead load during work.

After worn pins were rebored, the contractor began the tightening of all main truss eyebars that had become loose. Thirteen percent of the truss eyebars in the bridge were loose causing over stresses in other truss members. Of these, 44 were readily adjusted by turning their turnbuckles. The remaining nine loose eyebars had no turnbuckles; they were adjusted with a flame-shortening process.

First, clamp plates and tension rods were placed around a 1-ft section of bar to keep the bar in proper alignment during the shortening, to control the extent of its deformation under intense heat, and to support the dead load across the bar while heat was applied.

The section of bar was heated to about 1.600 deg with acetylene torches. Clamp plates gripping the eyebar on both sides of the heated zone then were drawn together by tension rods to upset the heated area slightly. Upon cooling the eyebar was bearing tightly on the pins at each end.

continued on page 118

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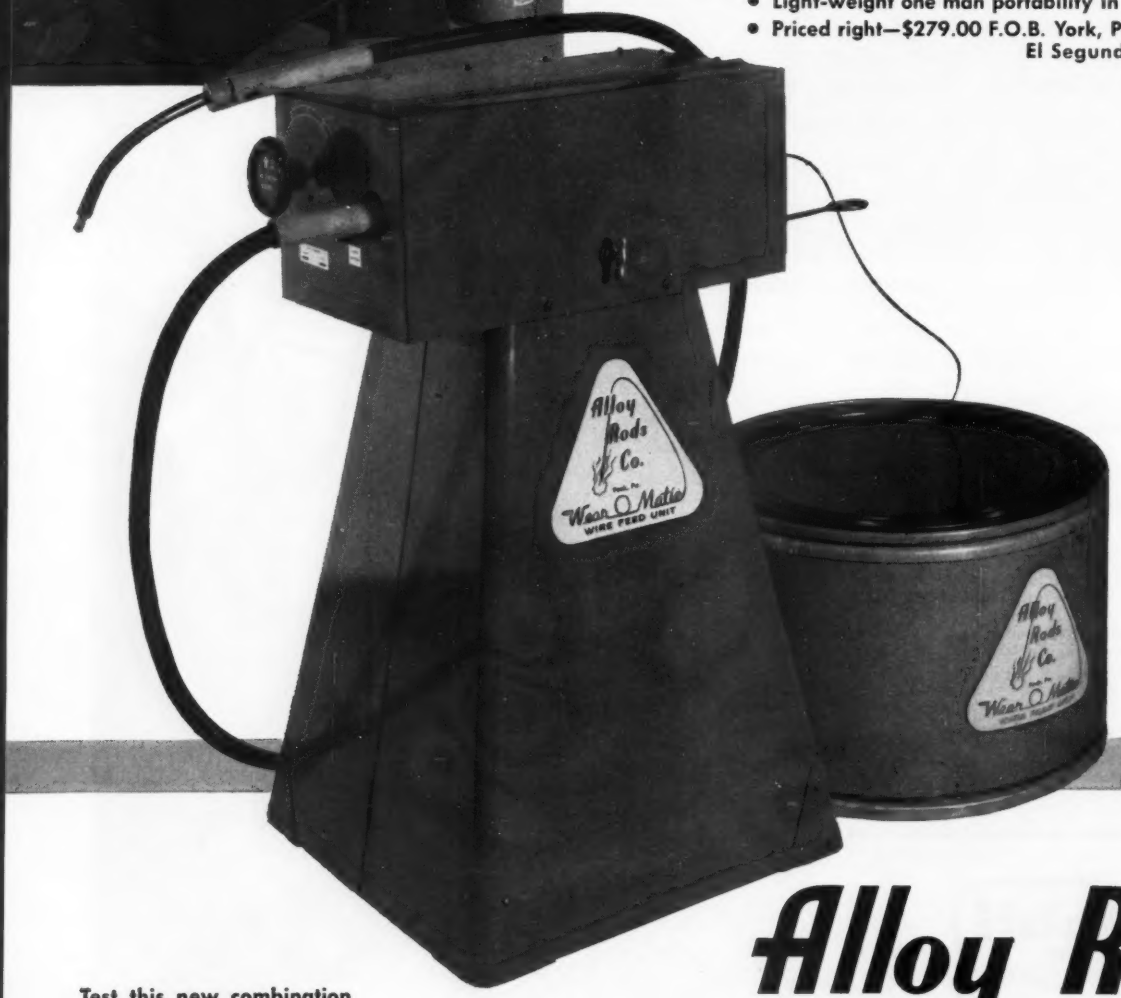

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- PAYOFFPAK® efficiency and economy
- Tension free wire feeding.
- Quick and simple wire change over.
- Accessibility and ease of operation.

Here's a new hard surfacing combination designed to cut maintenance costs through easier, faster, more economical application of wear resistant alloys.

From your first experience with the new Wear-O-Matic process, you'll appreciate the many conveniences of the *PAYOFFPAK*. The wire is cleaner and easier to handle and is free of tension for smoother trouble free wire feeding. Larger quantities of wire can be handled with greater ease of change over. There's no kinking or snarling of wires as is common with cumbersome, tightly wound coils.

Wear-O-Matic wire and the new Wear-O-Matic wire feed unit is the labor saving team that will ease your maintenance load. Welding is easy and continuous at speeds up to five times faster than manual electrodes. The Wear-O-Matic unit feeds the wire automatically at the proper pre-selected rate. There's no stopping to change electrodes, no stub loss, no cleaning, and spatter is negligible. And, Wear-O-Matic wires provide weld deposits of uniform metallurgy, chemistry, and wear resistance . . . assuring longer equipment life.

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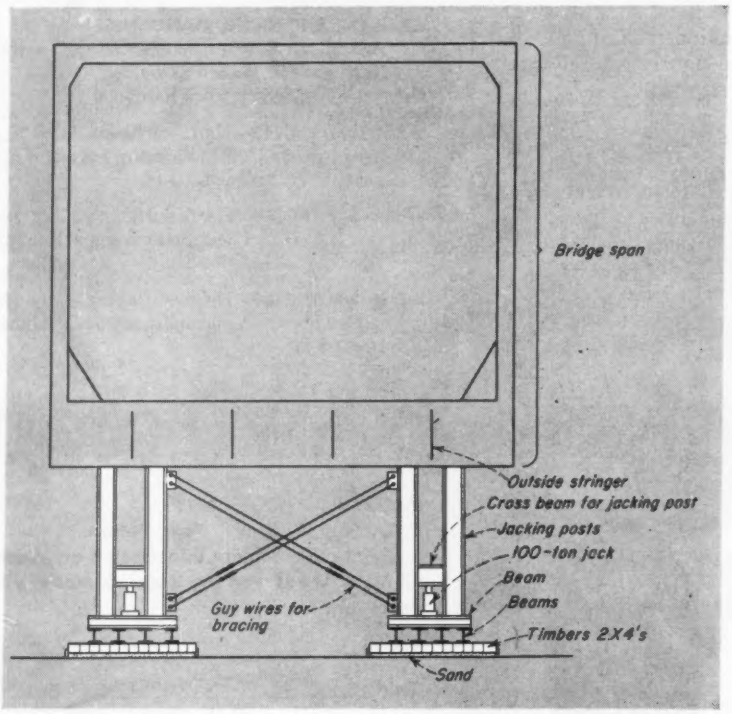
REPAIR OF OLD BRIDGE... continued from page 114

RAISING THE SPAN—Contractor F. K. Ketler Co. of Chicago built up eight cribs on which he set 100-ton hydraulic jacks. Jacks working simultaneously thrust pairs of jacking posts upwards to raise shore span slightly from its pier and slipped abutment.

Jacking Shore Span Back into Position



FALSEWORK—Shoring set over sand blankets to compensate for variances in grade relieves span of load both during connecting pin repair work and during resetting of the span.

The repair program included remedy of an increasingly serious condition at the juncture of the swing span and the adjacent shore span. Cap stones in the abutment had slipped, causing the shore span to move outward 2½ in. During hot weather it had become difficult to properly open and close the swing span because the shore span had moved and was binding at the railroad deck.

This condition was corrected by jacking the span back to its original position, then anchoring the slipped abutment masonry.

First the span had to be raised on falsework erected earlier for reboring work. This falsework consisted of eight cribs built up beneath the shore span. Each crib was set over a layer of sand to allow for variations in the pier's grade. Sand was retained in a 7x8-ft box made up of 2x4's. Over the sand, seven 6x12-in. timbers 7 ft long were placed and topped transversely with four lengths of I-beams 7 ft long and on 1½-ft centers.

Crossing a single reinforced I-beam over the four previously

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placed beams completed each crib. This beam served as a seat for a 100-ton hydraulic jack and two jacking posts that extended up to the bottom chord of the shore span. A small section of beam welded to the jacking posts 2½ ft up from the reinforced beam took the stroke of the jack. The eight hydraulic jacks were worked simultaneously to raise the span clear of its piers.

While the span was held raised, abutment masonry was repaired. This was done by sending anchor bolts through into solid masonry that had not slipped from its original position. Pressure grouting through the anchor bolt holes before anchors were placed strengthened the back of the masonry.

Jacking Span

Next step was to jack the span horizontally 2½ in. back to its original position. This was done by building two 45-deg jacking brackets from sections of steel beam which were anchored to the concrete paving about 20 ft from the abutment face.

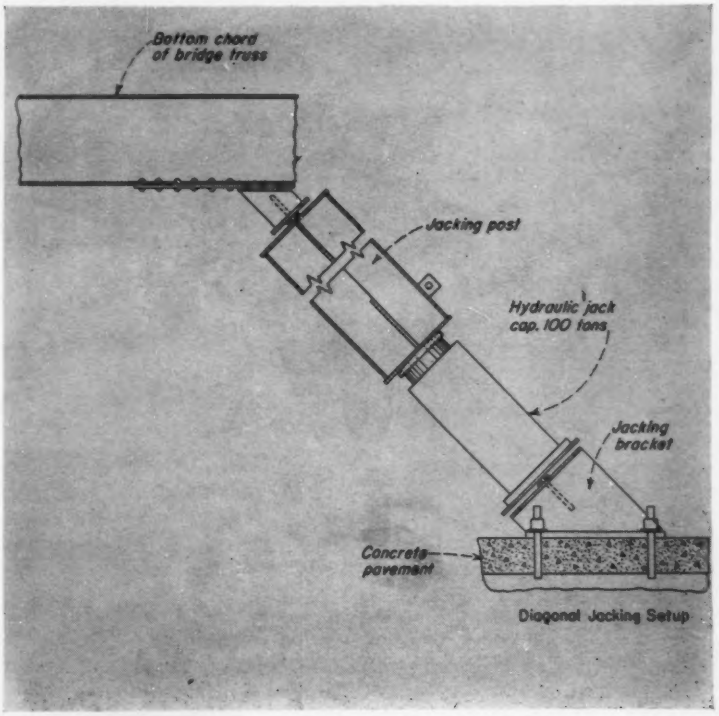
A 100-ton hydraulic jack reacted against each bracket and thrust against a section of beam that ran up to the bottom chord of the bridge truss. Actuating both jacks simultaneously pushed the truss back horizontally to its original position.

Power Line Safety

While the shore span was being moved or when repairs required working near any of the transmission towers on top of the bridge, the contractor arranged with the power company to de-energize six overhead 13,000-volt transmission lines. Voice signals transmitted by portable short wave radios directly to the Iowa Illinois Gas and Electric Company control room in Davenport kept workmen constantly informed of when the lines were actually out of service and not dangerous.

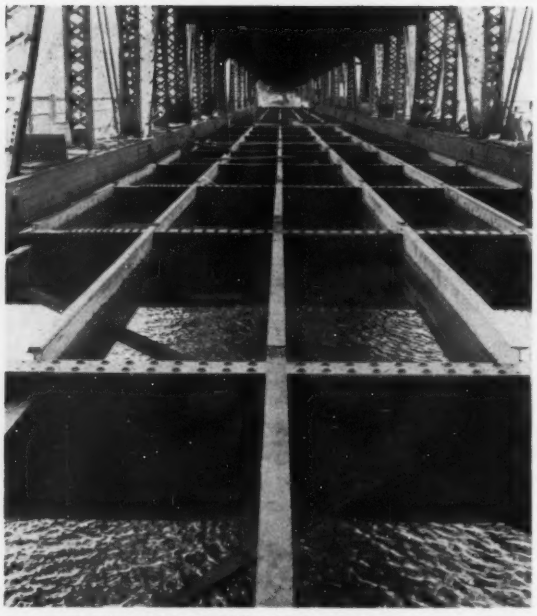
The direct radio communication also made it possible for the power company to have work areas cleared on short notice when emergency conditions elsewhere in the network required reenergizing the circuits. The same signaling system was used while transferring wires to newly erected tower. *continued on next page*

JACKING RIG—A 45-deg jacking bracket, anchored to paving, seats a 100-ton hydraulic jack that thrusts against a section of beam run up to the shore span's bottom chord.



HORIZONTAL JACKING—Repair of shore span required first lifting span off its pier and abutment then jacking it horizontally 2½ in. back to its original position.

STRIPPING OLD PAVEMENT—Front end loader dumps bucket of wood blocks and bituminous concrete stripped from deck.



REINFORCING DECK STRUCTURE—Deck beams on bridge are reinforced with bolted coverplates and stringers with welded I-beams.

NEW ROADWAY—Crane lifts Greulich steel grating panel and lowers it into place over steel stringers. Grating, supplied by Kerrigan Iron Works, will carry concrete surface.

Rebuilding The Roadway

Last work on the job involved stripping the old roadway down to steel stringers and replacing it with concrete-filled steel grid. The old paving consisted from stringers on up of 6x8-in. joists, then 3 in. of planking, a layer of 4-in. timber blocks, and a 1-in. layer of bituminous paving.

A front-end loader stripped the bituminous paving and wood blocks. Planking and joist removal was by hand and crane. When paving had been stripped to stringer level, the Lima crane was moved under the bridge to lift 7¼-ft-wide Greulich Grating panels into place. Whiting Turner Co. of Baltimore, Md., erected the grating that was supplied by the Kerrigan Iron Works.

Modjeski and Master whose founder, Ralph Modjeski designed the bridge in 1895, prepared design plans and specifications for the Corps of Engineers, Chicago District.

W. B. Throckmorton was chief engineer for the railroad. J. F. McCook was project engineer for Ketler, Falsework, spidering, and erection procedures were designed by Plumb, Tuckett and Pikarsky under the direction of the authors.

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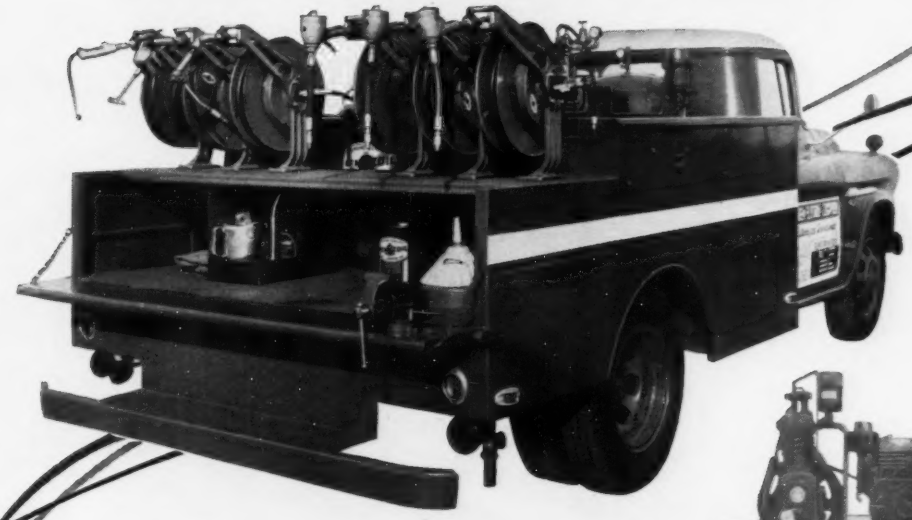

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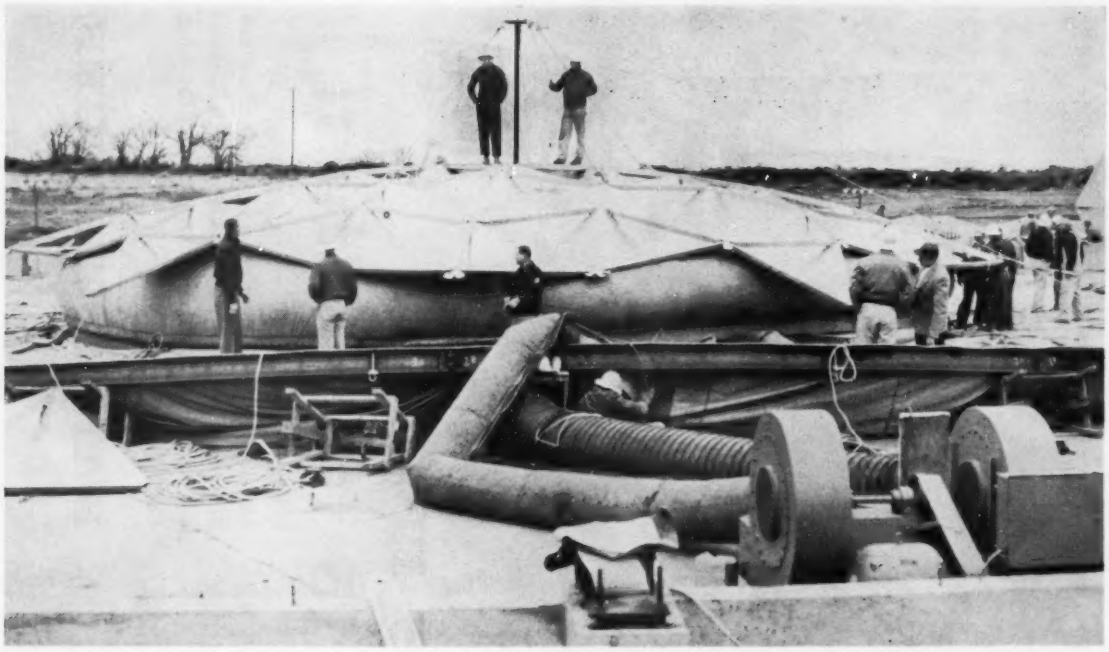
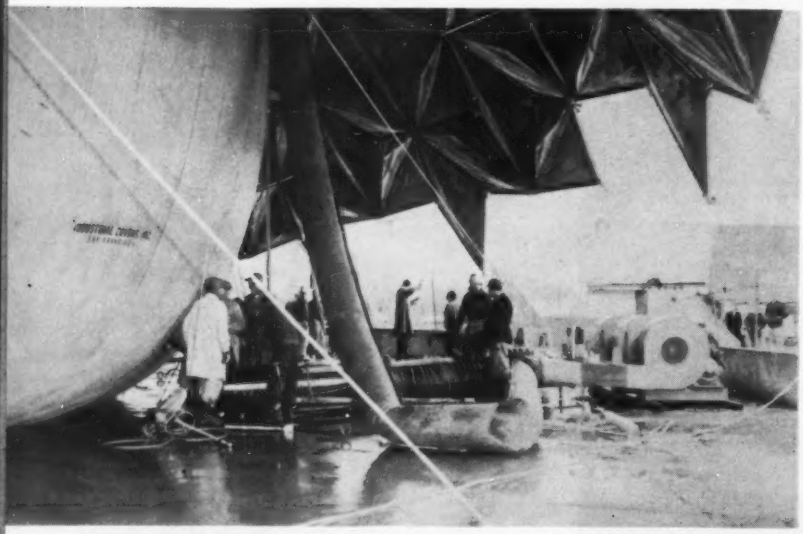


STARTING LIFT—Uppermost portion of dome panels sits over partially inflated bag. This bag nests in a larger tub-like bag not yet inflated. As the bags expand, workmen at ground level bolt on additional aluminum panels to the geodesic dome's perimeter.

Air Bags Raise Geodesic Dome

BAGS OF AIR working like pneumatic jacks helped a 38-man crew erect an aluminum panel geodesic dome for an Abilene, Kans., factory in only 22 working hours.

Three similar domes previously had been raised. For these a 96-ft-high central mast raised and supported the dome as the panels were assembled. This required a number of winches and considerable guying of the dome during the lift.



LIFT COMPLETED—When dome finally is raised to its full 49-ft height, 25 anchor panels are bolted to concrete piers. Bags then are deflated and pulled from under structure.

The unusual air-bag substitute came about when Vacu-Blast Co. of Belmont, Calif., decided to build a geodesic dome factory for its subsidiary Fi-Fo Conveyor Co. in Abilene. Fi-Fo is licensed by Kaiser Aluminum & Chemical Co. to fabricate and erect geodesic dome structures.

The dome, made of Kaiser aluminum panels, is 49 ft high and 145 ft in dia over a concrete foundation of 25 piers. The contractor first built the concrete foundation that was to support the dome then poured a concrete floor slab to serve as a work platform.

Fi-Fo called in Industrial Covers, Inc. of San Francisco to work out a system for raising the dome. Industrial designed two deflated bags made of duPont's "Hypalon" coated nylon. The larger bag, set on the floor inside the foundation perimeter, measured 95 ft in dia. It was shaped like a tub to form a nest for a 50-ft bag.

Three centrifugal blowers each with a capacity of 4,450 cfm partially inflated the top bag through an 18-in. duct. Workmen then connected panels for the upper-

continued on page 130

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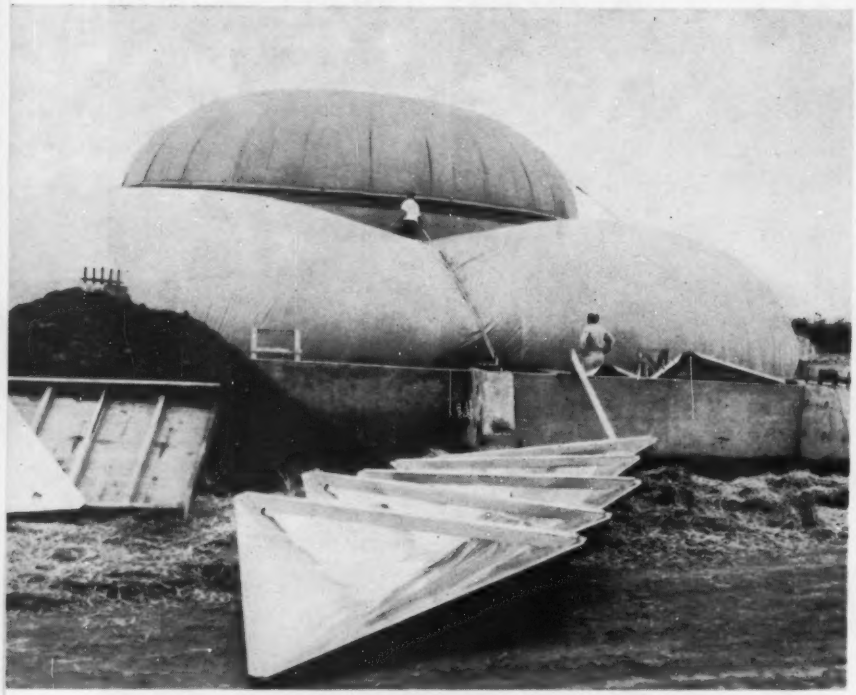
Ford Mobility proves itself in such "offbeat" tests as when heavy rain leaves the rig stranded in a sea of muck. Here Mr. Mix is shown using first the digger and then down-pressure of the loader to "walk" the tractor to firmer ground.

Ford Tractors and equipment can save time, manpower and money on your *jobs, too. See your nearby dealer, or write to:* **Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.**

because they save more money!

AIR BAGS RAISE GEODESIC DOME . . . continued from page 126



TESTING BAGS—Small bag stands inflated on partially inflated large bag during test run prior to actual construction. Bags are made of DuPont's "Hypalon" coated nylon.

most part of the dome over the top bag. Then, while the bag was inflated further, workmen added perimeter panels.

When the top bag had been fully inflated, the bottom bag was slowly blown up, raising the dome still higher. Workmen continued to attach perimeter panels until the structure was fully raised and anchored to its foundation. A total of 575 panels bolted together at their edges went into the job. Men worked at ground level throughout. The contractor guyed the dome during the raising by wires attached to 20 Griphoists anchored to the ground.

Bags finally were deflated, disassembled, and pulled out from under the dome. They were packaged easily into an area equivalent to a 1½-ton truck bed.

Gordon Holcombe, president of Industrial Covers and designer of the bags, claims they can be used for many other types of construction, including erection of large steel tanks. These, he says, can be assembled and welded at ground level, then later raised.

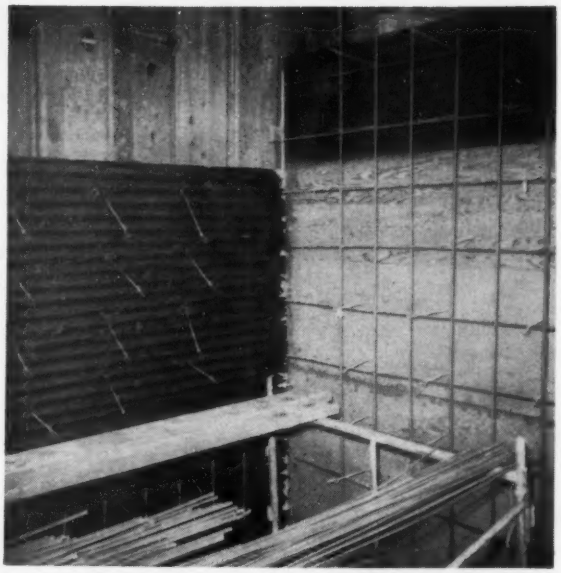
What Happens When You Can't Cross Property Lines to Form a Wall?

With only one-inch clearance to work in, here's how a problem was solved with Gates.

Problem: In forming the 14-foot-high foundation walls of this job, the contractor was not allowed to trespass on the adjoining property in any way, so all forming had to be done from the inside. Clearance between the foundation wall and the property line was one inch. In addition, exterior below-grade damp-proofing was specified by the architect.

Solution: Working with the local Gates representative, the contractor selected Gates Vertical Rod System for the job. Asphalt-coated corrugated metal sheets were used for the outside form panels and allowed to float. Conventional Gates methods were used for the inside of the wall. With the architect's approval, the coated metal sheets and 14-foot steel rods were left in place after the concrete was poured.

Results: The unique forming method cost no more than conventional Gates forming. Excellent results were obtained. This proven versatility of Gates Forming Systems can help you, too. Why not investigate?



Concrete forms—foundation wall of Harris Building, Oklahoma City, Oklahoma. Note corrugated metal sheets used for outside form panels.
Contractor: Commander Construction Co., Oklahoma City
Gates representative: Vernon L. Mock Co.

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SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE

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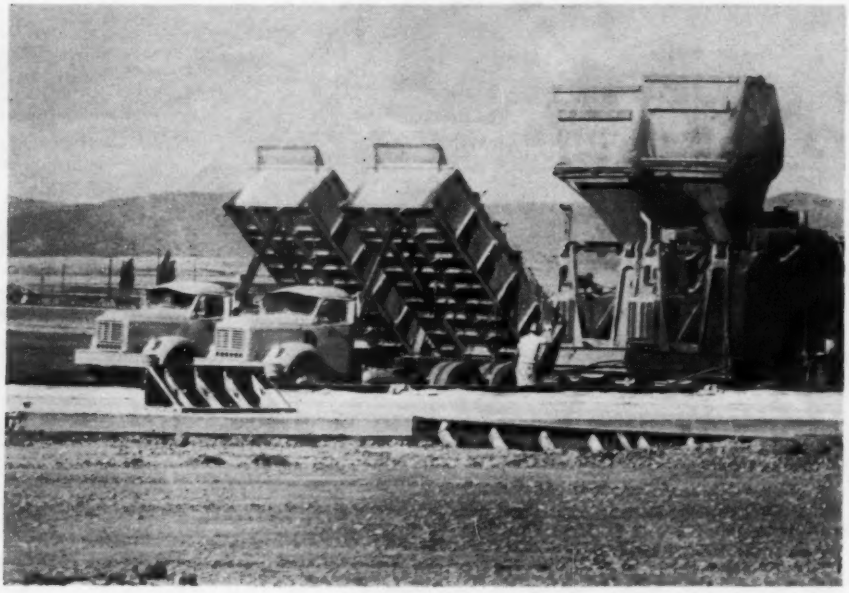


An experienced crew with four pavers lay as much as 6,500 cu yd of runway pavement in a single day.

Paving Crew Hits Record

PAVERS—Working in tandem from the adjacent unpaved lane, four Koehring 34E pavers place concrete in a 25-ft lane. Pavement thickness varies from 20 in. up to 31¼ in.

MASS PRODUCTION—A fleet of 24 Cook Bros. 10-wheel trucks, each with a capacity of five 1½-yd batches, delivers dry concrete mix to the four dual-drum paving machines.

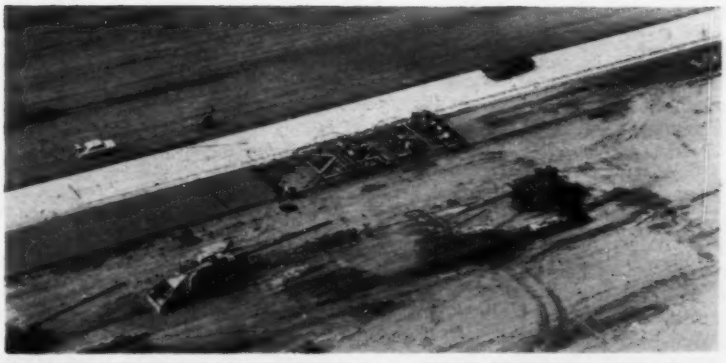
Pace on Air Base Job

PLACING 5,000 cu yd of concrete a day to the strict tolerances required for a heavy bomber runway is a spectacular feat. But that's the average daily production a crack paving team achieved during a two-month period at Beale Air Force Base, near Marysville, Calif.

With four Koehring 34E dual drum pavers arranged in tandem, they put down 229,000 cu yd of concrete pavement for a 12,000-ft runway at an average daily rate of 5,100 cu yd. Peak production exceeded 6,500 cu yd in a day. These rates probably are the highest ever recorded for airfield paving.

The joint venture responsible for this record-breaking performance is sponsored by Ross A. Westbrook, Inc., and includes Morrison-Knudsen Co., Inc., and H. Earl Parker, Inc. It holds a $10.3-million contract that includes 4,500,000 cu yd of earthmoving and a total of 485,700 cu yd of paving—for taxiways and 46 acres of parking and warm-up aprons as well as the runway.

The runway is 300 ft wide and varies in thickness from 20 in. up to 31¼ in. Runway paving was completed last fall; work on the



SPREADER—A Blaw-Knox 25-ft concrete spreader with 10 high frequency internal vibrators (right) and two special Lewis finishing machines follow the four Koehring pavers.

FINISHER—Lewis transverse longitudinal float finishing machine is equipped with a mechanical tamper, two heavy steel floats, and two 24-ft "V" floats 16 ft long.

BATCH PLANT—Two Conveyco automatic batch plants mounted side by side and fed by three conveyors supply up to 700 cu yd per hr. Cement storage capacity is 8,800 bbls.

taxiways, parking aprons, and warm-up aprons will begin early this year.

One reason for the record pace of the paving operation is the experienced crew on the job headed by Oliver P. Pope, project manager. For Pope and many of his men this is their fourth major air base paving job since 1953. The others were Davis-Monthan Air Force Base in Arizona and March and Castle Air Force Bases in California.

Another reason is the careful advance planning that made possible the tight coordination necessary to maintain such a high production schedule.

Pope set up two Conveyco automatic batching plants side by side and adjacent to a crushing plant with a capacity of 16,000 tons a day. Each of the batch plants is equipped with a re-screening device and with electronic cement, sand, and aggregate scales. Three belt conveyors feed the batch plants. Cement storage is 8,800 bbl, and the dual plants have a capacity of 700 cu yd per hr.

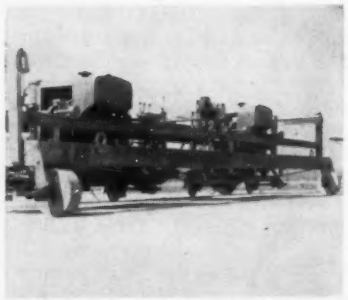
Average batch haul for the runway paving was 12,000 ft on one-way haul roads. A fleet of 24 Cook Bros. 10-wheel trucks, each with a capacity of five 1½-yd batches, delivered dry concrete mix to the four paving machines.

Traveling in the adjacent unpaved lane, the pavers placed concrete in 25-ft lanes. A Blaw-Knox 25-ft concrete spreader with 10 high frequency internal vibrators spreads the mix.

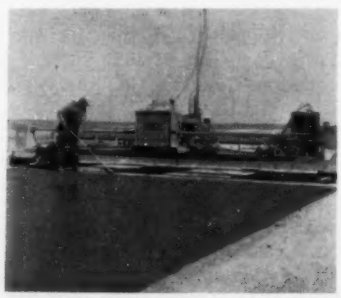
Next in the paving train were two machines designed by Hurst Lewis and built by the Concrete Manufacturing Corp. of El Monte, Calif. The first was a Lewis leveling attachment with strikeoff screed and pan type vibrator. Following it was a Lewis transverse longitudinal float finishing machine equipped with a mechanical tamper, two heavy steel floats, and two 24-ft "V" floats.

Pavement was cured with double "wet" burlap for 24 hr and then sprayed with a membrane curing compound applied with a Rex automatic spray machine.

J. D. Hitchcock is project engineer for the Corps of Engineers with G. F. Anderson as assistant.



CURING—After a 24-hr wet burlap cure, a spray machine applies membrane cure.



SAWING JOINTS—Three Joint Master saws with diamond blades cut joints.

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This Warranty shall not apply to any trailer, or part or parts of any trailer which, in the judgment of LaCrosse Trailer Corporation, shall have been modified, repaired or altered in any way, so as to impair its strength or stability, or which has been subjected to misuse, negligence, or accident.
This Warranty is in lieu of any and all other warranties, expressed or implied, and no distributor, representative, or other person is authorized to make any warranty or representation on behalf of LaCrosse Trailer Corporation. LaCrosse Trailer Corporation shall in no event be liable for consequential damages, its obligation pursuant hereto being limited to replacement of defective parts on the conditions herein contained.
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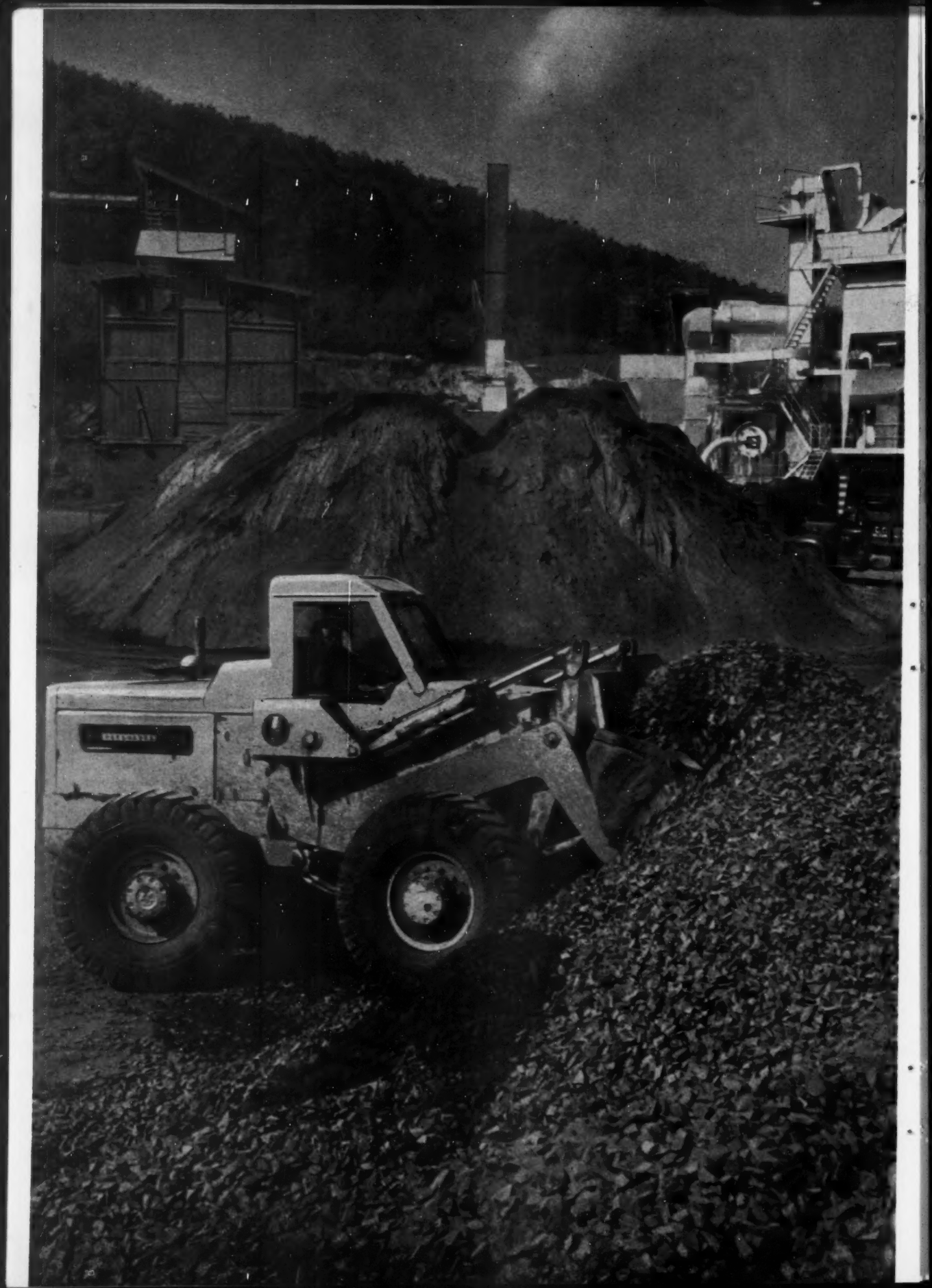

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2-B-1

SHORING—Timber beams support lath form over 6-ft span between joists during pour. Lath normally spans only about 3 ft.

Contractor cuts labor and material costs of forming a concrete floor slab by substituting a manufactured reinforced floor lath for wood forms.

REINFORCING—Steel bars reinforce slab. Main role of Steeltex is as a form, but its wire mesh also helps strengthen the slab.

Floor Lath Acts as Slab Form

MOST FORMING METHODS work best in their designed role. But sometimes an alert contractor applies one in a new way and makes it pay.

Whitacre Engineering Co. of Canton, O., figure they cut forming labor costs 50% and saved $26,000 on material by substituting Steeltex floor lath, a commercial product, for wood forms on a job involving 200,000-sq-ft of concrete floor slab.

Steeltex, made by the Pittsburgh Steel Co., is a sheet material designed to span steel or concrete joists and act as both a form and a reinforcement for light floor slabs. It consists of a cord-reinforced, waterproof backing to which a 12-gage, 3x4 wire mesh is attached. The mesh is wired to the backing in such a way that the weight of the concrete separates it from the backing, and it becomes the reinforcing in the slab.

Steeltex works best on spans of less than 3 ft. But Whitacre figured it would be economical to put it over 6-ft spans between joists on a $3.5-million extension to the fifth and sixth floors of the Henry Ford Hospital in Detroit, Mich.

The 3½-in. slab, supported at 6-ft centers, required more reinforcing than a 12-gage mesh, so Whitacre put in a mat of heavier reinforcing bars. Although the Steeltex acted mainly as a form, its mesh did strengthen the slab.

It took three men one day to install 3,500 sq ft of Steeltex forming. Mike Malett, foreman for Whitacre, figures that it would have taken 10 men two days to install a similar area of wooden forms.

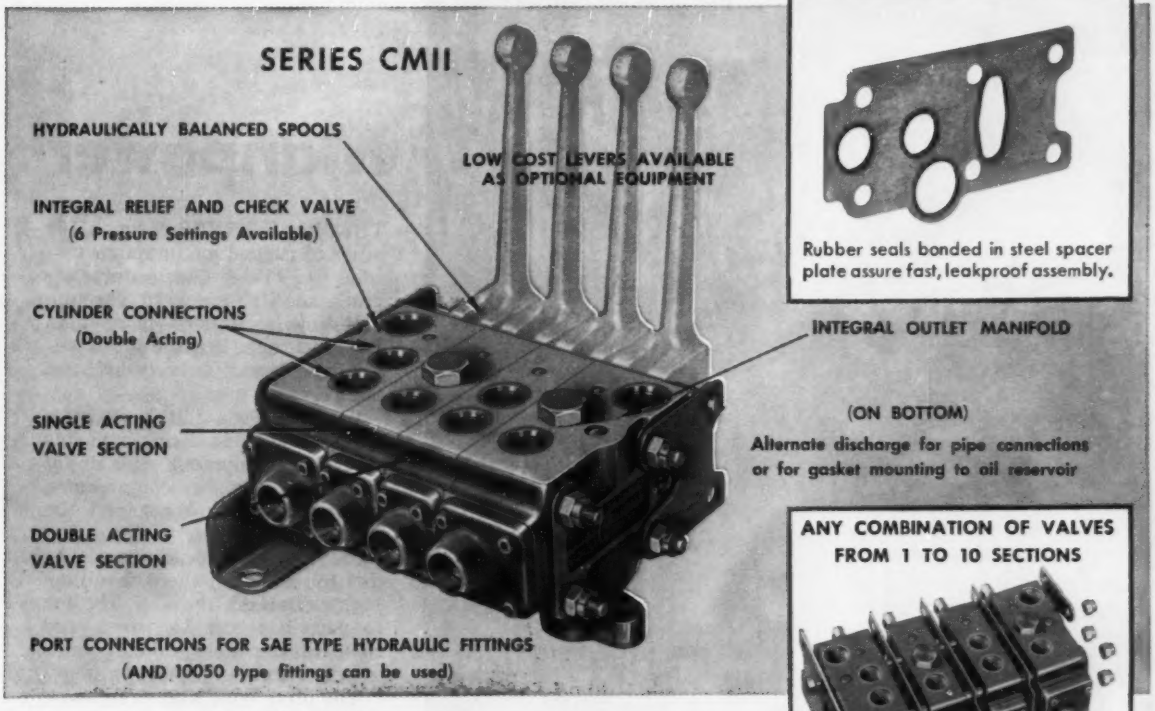
Installing ceiling hangers also went faster because all the crews had to do was stick the hangers through the paper backing. With wood forms they would have had to drill a hole in the form for each hanger.

Ordinarily, on 2 or 3-ft centers, Steeltex can support the weight of men walking on it plus the weight of the concrete slab. In this case, with the 6-ft spans, it took some temporary timber shoring between the joists to support the slab during the pour. The amount of shoring was about the same as wood forms would have required.

Mallett found that Steeltex is easy to form around columns and pipe and cuts down the drip-through of wet concrete. Its waterproof backing also helps cure the slab.

A. M. Downes was field engineer for Whitacre.

For Improved Operation of Mobile Equipment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Easy Sectional Assembly

Improved Vickers CM11 Multiple Unit Valves

Improved control, greater convenience and economy have been provided by this new design of Vickers Series CM11 Multiple Unit Valves. They are widely used on such applications as: material handling equipment, farm tractors, construction and mining machinery, bucket loaders, and many other types of mobile equipment where accurate control of hydraulic power is required.

Simultaneous Functions

Valves may be operated individually or simultaneously. Saves operator's time on the job. Full pump delivery is available at any one valve when operated singly.

Precise Control

Improved metering characteristics and Vickers exclusive porting arrangement make possible a smooth and selective control . . . greater precision in nudging, crowding, inching and positioning. Valve spools are spring centered to neutral position and hydraulically balanced to prevent kicking-out due to excessive back pressure or surges. A check valve in the inlet prevents pressure surges at the cylinder from acting destructively on the pump.

Overload Protection

Tamper-proof integral relief valve provides excellent overload protection and low override characteristics. Relief valve is preset at factory to any one of 6 cracking pressures from 500 to 1750 psi (250 psi increments).

High Capacity

Maximum capacity is 12 gpm with three or less valve sections, or 9 gpm with over 3 valve sections. Maximum working pressure is 2000 psi.

Sectional Assembly

A high degree of control flexibility from minimum inventory is assured users requiring a variety of valve assemblies.

Seal Plate Subassembly

Steel spacer plate with rubber seals bonded in place allows rapid, leakproof assembly of valve sections. Plate subassembly permits instant, positive joining of sections with no danger of overstressed through bolts and cramped valve spools.

Minimum Space and Weight

Simplified design and construction characterize CM11 valve assemblies. Valve end sections combine in one casting the inlet or outlet manifold together with any operating valve section . . . saving space and weight.

Easy Mounting

Mounting is a simple three-point installation. Cylinder connections are ¾-16 UNF-2B thread (SAE type) . . . inlet and discharge ports are ⅝-14 UNF-2B thread (SAE type). Alternate discharge connections in bottom of end sections provides for gasket mounting to oil reservoir or to ½" threaded pipe.

Interchangeability

Interchangeable valve sections assemble for both original and conversion equipment with minimum stock requirements. Added operations are quickly accommodated simply by adding suitable valve sections.

For further information, write for Bulletin M5101A.

7852

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
Mobile Hydraulics Division

ADMINISTRATIVE and ENGINEERING CENTER
Department 1494 • Detroit 32, Michigan

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IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto and Montreal

BRIDGEBUILDING—Workman rides bos'n chair across ravine to pick up a load of material and carry it back. Concrete mixer (rear) is one of few machines on the job.

Manpower

THE ROAD WINDS through 190 miles of rugged mountainous terrain. Its bridges span steep ravines, and its tunnels cut through limestone mountains more than 10,000 ft high. But the job is being done almost entirely by hand labor.

Clearly, it's a job for a huge variety of roadbuilding machinery. But equipment consists of two bulldozers, two compressors, a few concrete mixers, and the human machine—a work force of more than 11,000 laborers who day by day push the $10-million highway ahead by hand. The job to date has cost 140 lives, and some of the most difficult work is yet to come.

The place is Taiwan (Formosa), island bastion of Nationalist China

TUNNEL—Laborers hammer and chisel away on a section of highway that cuts through rock. Much of the 3 miles of tunnel on the job is drilled and mucked by hand.

With little help from equipment, 11,000 Chinese laborers perform a near miracle in building 190 miles of road, 26 bridges, and rock tunnels through near impassable terrain.

Builds Formosa Road

located 90 miles from the communist mainland. When completed in mid-1959 the road will connect the east and west coasts of the island. The road, 16 ft wide and gravel-surfaced, runs from sea level to as high as 7,500 ft.

A primitive way to build a road? Actually, the Chinese have no choice. The terrain for most of the right of way is so rugged heavy machinery just can't be brought in. Even attempts at air lifts have failed.

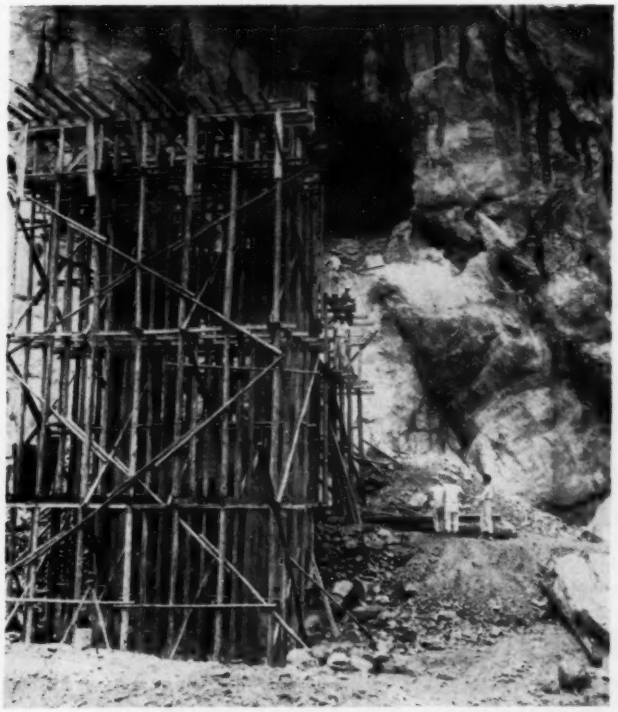
Jeeps and trucks can operate on the coastal portions of the road, but beyond these areas work must be done by hand. And supplies must be transported to work areas by foot over spindly suspension bridges that can carry a maximum load of five men.

No structural steel goes into the job. All of the road's 26 bridges are of prestressed concrete. Reason for this is that concrete components such as cement and gravel can be carried in bags over suspension bridges along with the wire, jacks, and pumps for stressing operations at the work site. Shoring, falsework, and forms for bridges are hewn from timber at the site.

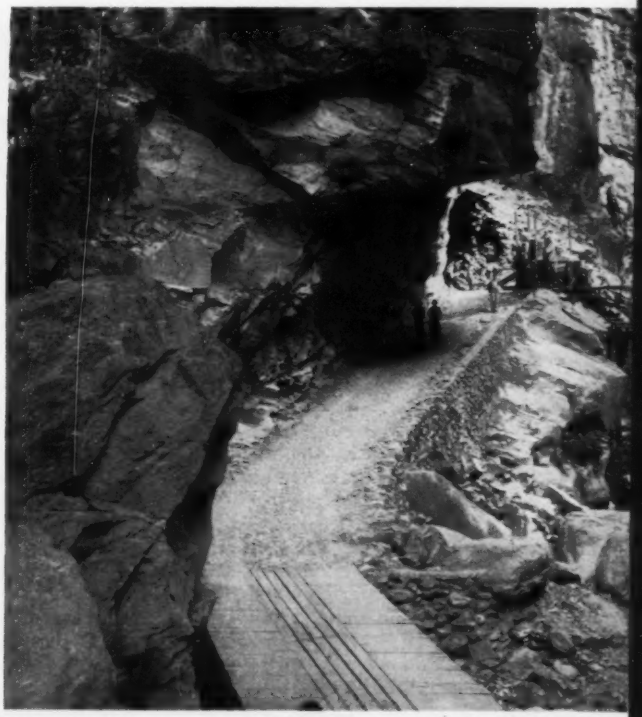
Tunneling is the most treacherous part of the work. Swarms of laborers with spike and mallet drill blast holes to 5-ft depths to slowly edge their way through the stone. Even so they use up to 30 tons of dynamite monthly. Mucking is done by hand. Basic tools on the road work proper are picks and shovels.

President Chiang Kai-shek saw the road as a way to open up the central wilderness to farming and cattle-raising providing employment for thousands of ex-servicemen. Officials estimate that thousands of acres of tillable land, forests, and rivers along the right of way will be open to explorations. Rivers, too, will provide new sources of water power.

Technical difficulties and war delayed the beginning of construction until March, 1956. Some $6.9 million in U.S. aid supplements $4 million put up by the Nationalist Chinese government to finance the project. Traffic on the completed road will be one way with cut-offs every three miles to enable cars and trucks to pass.



FALSEWORK—Guy wires brace extremely high rough shoring against lateral movement. Shoring is hewn from timber at site.



HAZARDS—Cuts through obstructing ledges add to job hazards which to date have cost 140 lives and the worst work is yet to come.

TWO JOBS—Michigan tractor with dozer blade and steel compactor wheels levels fill, then compacts it. In tests on Illinois Toll Highway it is averaging 810 lb of compression per inch of roll face.

Dozer Doubles as Compactor

VETERAN ROADBUILDERS along the Illinois Toll Highway couldn't decide whether the big machine working on the fill was a dozer with compactor wheels or a compactor with a dozer blade.

Both sides were right. The machine actually was a test version of a standard rubber-tired tractor-dozer—a Michigan model 180—with its tires replaced by a set of steel compactor wheels. They now are available as a standard attachment from Clark Equipment Co.

Put through its paces at Huntley, Ill., by McCarthy-Mass-Dillon Construction Co., the machine produced some startling results when soil conditions were right, according to Clark field engineers. It first was tested against a water-ballasted, crawler-drawn sheepsfoot roller on fill consisting of silt, clay, and some sand. Five Euclid TS-24 scrapers brought in the fill at an average of 150 yd per hr each and placed it in 8-in. lifts. Moisture content at the time of the test was 12%.

The test showed that the sheepsfoot roller reached a compaction of 85.5%, modified Proctor, in four passes. The dozer-compactor developed 100.5% in two passes. Working together, three passes with the dozer-compactor and four passes with the big sheepsfoot roller developed 117.2% compaction.

In another test area, where fill consisted of clay, some sand, and rocks up to 5 in. in dia, the dozer-compactor produced a Proctor reading of 96.5% in one pass. One pass with the sheepsfoot roller produced 70%, and it took six passes to get 99% compaction. Working together, one pass of the sheepsfoot roller and one pass with the dozer-compactor developed 101% compaction.

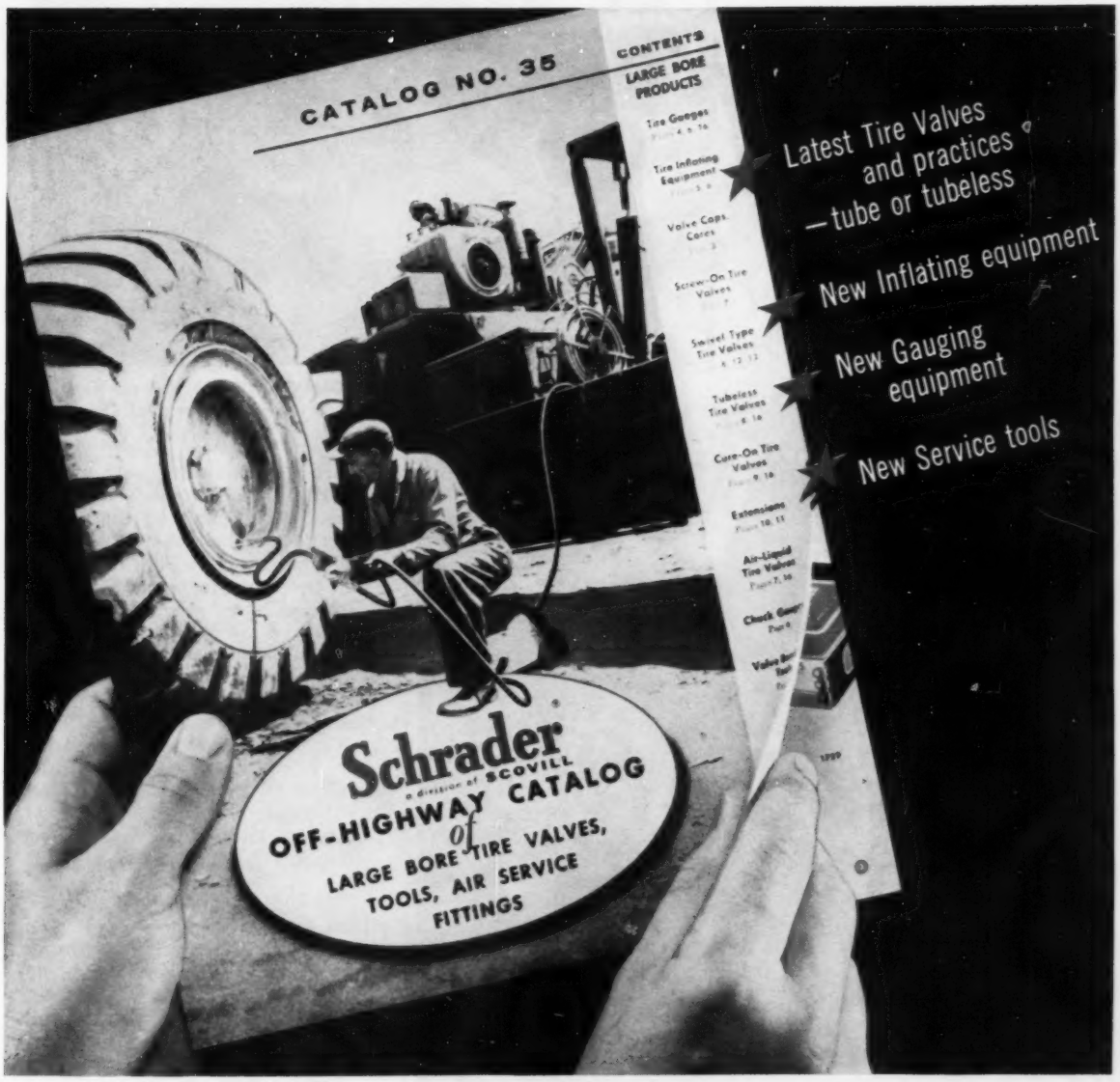
The next test was on type A gravel with some binder material, again placed in 8-in. lifts. Moisture content was about 5%. The dozer-compactor developed 102.6% compaction in three passes.

The tests also indicated there are compaction jobs that the dozer-compactor cannot handle successfully. The machine is not effective on sand or gravel that doesn't contain some binder material, on some types of granular or rocky soils, or on fills where excessive moisture content is a factor. It has also failed to perform well on certain soils when high densities are required, and on certain types of clay when placed in heavy lifts. But it did well on clay when the moisture was controlled and when lifts were held to 4 or 6 in.

Another apparent disadvantage is that the compactor wheels do not cover nearly as much ground with each pass as does a sheepsfoot roller. With the dozer-compactor, the operator must run inside his tracks on later passes.

But because the dozer-compactor works at higher speeds and produces a higher rate of compression per lineal inch of roll face, it actually had a time advantage when tested against the sheepsfoot roller on the McCarthy-Mass-Dillon job, according to Clark engineers.

Average working speed of the crawler-drawn sheepsfoot roller was 2.6 mph. Working speeds of



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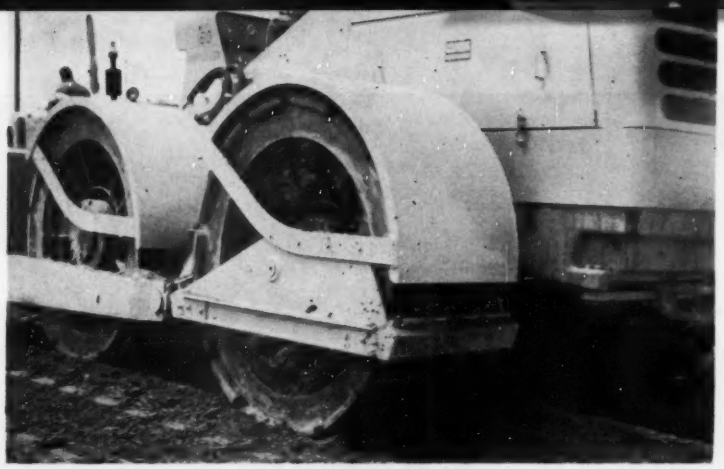
the dozer-compactor ranged from 5.3 mph in high gear to 3 mph in low, with the best speed for maximum compaction considered to be between 3 and 4 mph.

The 60-in. dia compactor wheels on the dozer are 22 in. wide on the front and 26 in. wide on the rear. This gives an effective rolling width of 52 in., much less than that of the sheepsfoot rollers. But the dozer requires fewer passes to produce high compaction percentages.



ROLLING WIDTH—Wheels in front are 22 in. wide; rear wheels are 26 in. wide.

This factor, together with the high work speeds of the dozer-compactor, more than off-set the advantage of the wider roll face on the sheepsfoot roller, according to Clark field engineers.

The dozer-compactor is designed to work on fills now handled by the larger pneumatic-tired rollers (notable exceptions are on soils containing a high percentage of sand or gravel). In the right soils, it might also substitute for steel drum rollers on sub-grade preparation jobs. It also works well in sand-silt or sand-clay soils when moisture is controlled.

When fitted with compactor wheels, the machine handles two jobs at one time. Besides serving as a compactor, the dozer blade can be lowered to level the fill, thus eliminating the need for an extra dozer. When dozing and compacting at the same time, the operator shifts to the low-speed range.

The same compactor wheels also can be mounted on the Michigan model 175A tractor-shovel, provided it is equipped with a 162-hp engine. This permits the contractor to pull the tractor-shovel off routine stockpiling jobs when necessary and to put it to work on the fill.

The basic machine, the Michigan 180 tractor-dozer, offers four-wheel drive, power-shift transmission, a torque converter, and planetary wheel axles. It is powered by a 162-hp Cummins diesel engine. With the compactor wheels and fenders, it weighs 36,000 lb, and about 57% of this weight is on the rear axle. Ground clearance with compactor wheels is 15½ in. and the turning radius is 32 2/3 ft.

NEW!

Now equipped with a new and larger Onan 12.9 hp engine, the new Miller AEA-200-L produces a full 225 amperes of continuous rated, high cycle welding current or, 5 KW of 110/220 ac power for operation of power tools, lights, milking machines, etc., or, 1 KW of dc power.

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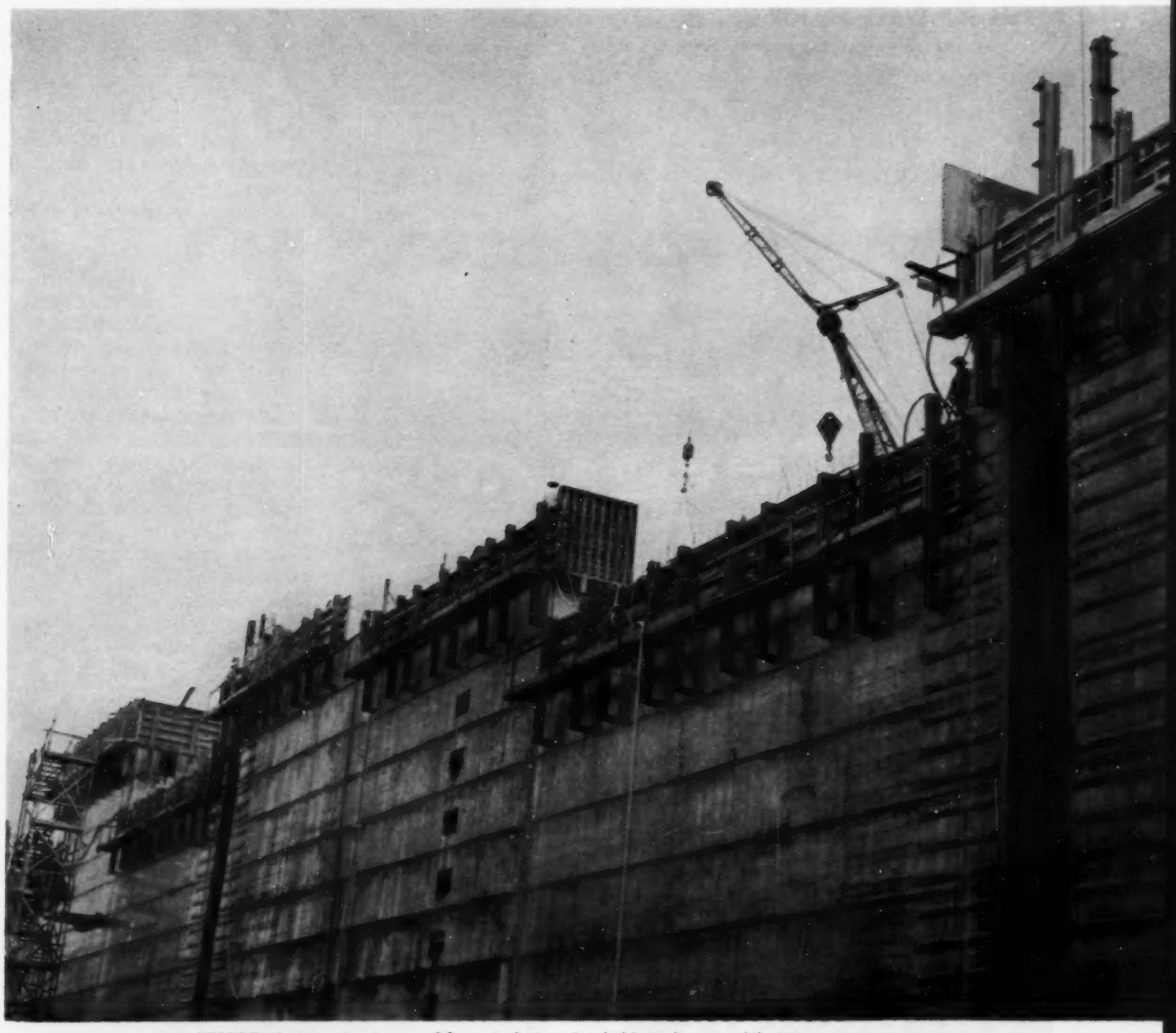


ARMOR—Last section in row of forms is designed to hold steel armor while it is cast as part of lock wall. Regular forms don't work because armor protrudes from wall face.

Steel Form Sets Wall Armor

A CONTRACTOR'S IDEA and a manufacturer's know-how combined to produce a better steel form for concrete lock walls that require protective armor.

Forming straight walls is no problem, especially with the various types of steel forms available today. But when specifications call for protective steel armor to be built into the face of the lock wall, standard forms don't work well.

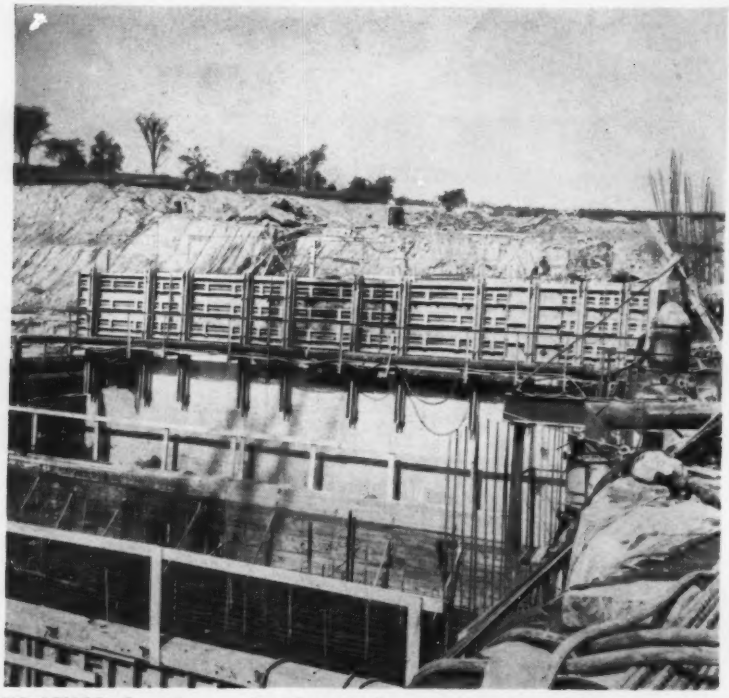
The armor must protrude from the face of the wall if it is to serve its purpose, so flat forms won't fit. And because the armor is an integral part of the wall, the wall forms must hold it in the proper position during the pour.

The usual method is to put wood facing on the form in sections requiring armor and cut away the wood to fit the protruding armor. The armor strips often vary in length so it is necessary to fabricate a new facing each time the form is moved.

The armor ordinarily is a modified T-section set into the wall. The main web of the T extends into the wall, and the head remains exposed. The exposed face is curved and protrudes ½ in. beyond the concrete wall face.

At the Greenup Locks on the Ohio River, Guy F. Atkinson Co. and United Construction Co., joint contractors on the Corps of Engineers river improvement job, needed a faster way to form armored lock walls. They asked Blaw-Knox Co. to develop a steel form that could be adjusted easily to handle various sizes of armor.

Blaw-Knox's Steel Form De-



NO ARMOR—Same forms work on flat wall when steel filler plates replace armor in the slots. Bolted in place, the plates need no further adjustment when the form is moved.

partment came up with an adaptation of their standard 5-ft cantilever form that handled the 18-in. to 55-ft lengths of armor on this job. And the same form works just as well as straight wall areas where there is no armor.

The standard form is basically a steel plate, 5 ft high and 10 ft long, with a bracing frame and working platform attached. Each panel hangs from two 1½-in. anchor bolts in the concrete wall.

To handle the armor, Blaw-Knox cut three horizontal slots in the panel, each 8-in. wide and running the entire 10-ft length of the form. The exposed face of the armor fits into these slots.

The device for holding the armor in place against the form is relatively simple. Two 4-in. channels, one on each side of the slot, are welded to the panel to form a track along which a shorter piece of channel can move.

The moving channel section goes opposite a bolt hole in the armor and a ¾-in. bolt from channel to armor pulls the armor

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MODEL SPR-9B

The same specifications as the SPR-9, except: a smaller power unit and heavy duty industrial type clutch . . . however, this power unit is still more powerful than all others in its class . . . same 4 forward speeds . . . same everything as in the "deluxe" model, but approximately $1,000 less.

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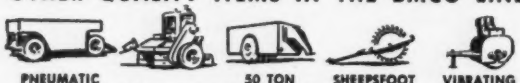

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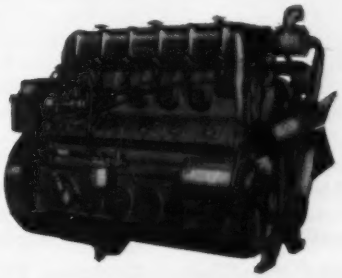
- **more responsive, faster starts, better idling than any other make of diesel**
- **delivers more power with less fuel —uses low-cost No. 2 diesel fuel**
- **25% fewer working parts and all wearing parts are interchangeable**
- **compact design results in easier maintenance—smaller parts stock**

For all your construction equipment — including front end loaders, scrapers, hoists, crushers and other portable equipment — specify the one diesel with all the features that deliver top performance — P&H Diesel. P&H Diesel Engine Division, Crystal Lake, Illinois.



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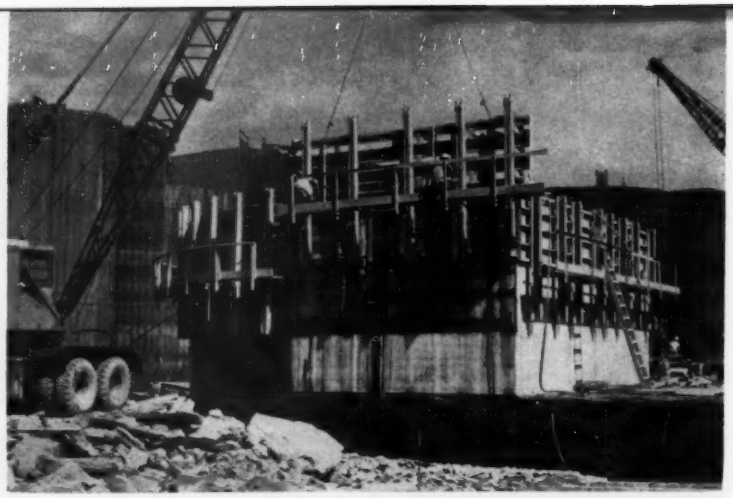
FORMS SET WALL ARMOR . . .
continued

against the form, holding it rigidly in place during the pour. The bolts come out when the form is stripped.

In areas where there is no armor, a flat steel plate 8-in. wide goes into the slot to make the face of the form flat. An angle welded to the back of the plate allows it to be bolted to the moveable channel section.

Armor may be specified in a variety of patterns for any spot where a barge is likely to hit the lock wall. The forms are designed to handle these different patterns or length of armor. Erection crews simply place armor in the forms where specified and fill the remainder of each slot with the flat filler plates.



POSITIONING—Protruding armor will be bolted into open slots in the steel form.

Because the forms are steel, they are rigid enough to pull a warped piece of armor into position. Sometimes the armor arrives on the site somewhat bowed and would be hard to handle in a wood form.

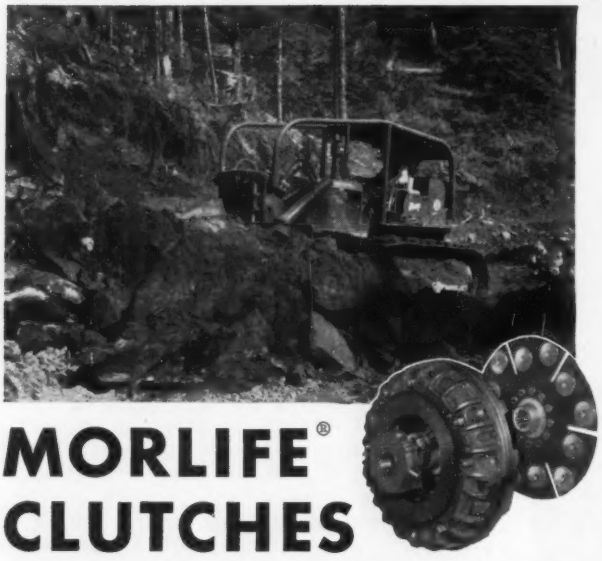
The cost of any steel forming varies with its complexity and with the quantity ordered so it is difficult to compare the cost of standard and armor-carrying forms. But the special forms are roughly 25% more expensive than standard steel forms. They have the advantage of being equally adaptable for armored or flat walls.

Blaw-Knox developed the forms for the Greenup project where they were used for the first time. Since, then, Perini Co. has bought similar ones for the Grasse River Locks on the St. Lawrence Seaway. Several other large jobs, including the Hildebrand Locks in Kentucky, the TVA Wilson Locks in Alabama, and the Port Allen Locks in Louisiana, either are using forms of this design or plan to use them.

The Greenup Locks, part of the Ohio River development program, are 143 river miles above Cincinnati. The main lock is 110x1,200 ft, and the auxiliary lock is 110x 600 ft. The job involves 402,000 cu yd of concrete.

D. J. McMahon is project engineer for the joint venture, and J. R. Johnson is project manager.

ROCKFORD



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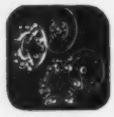
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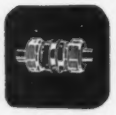
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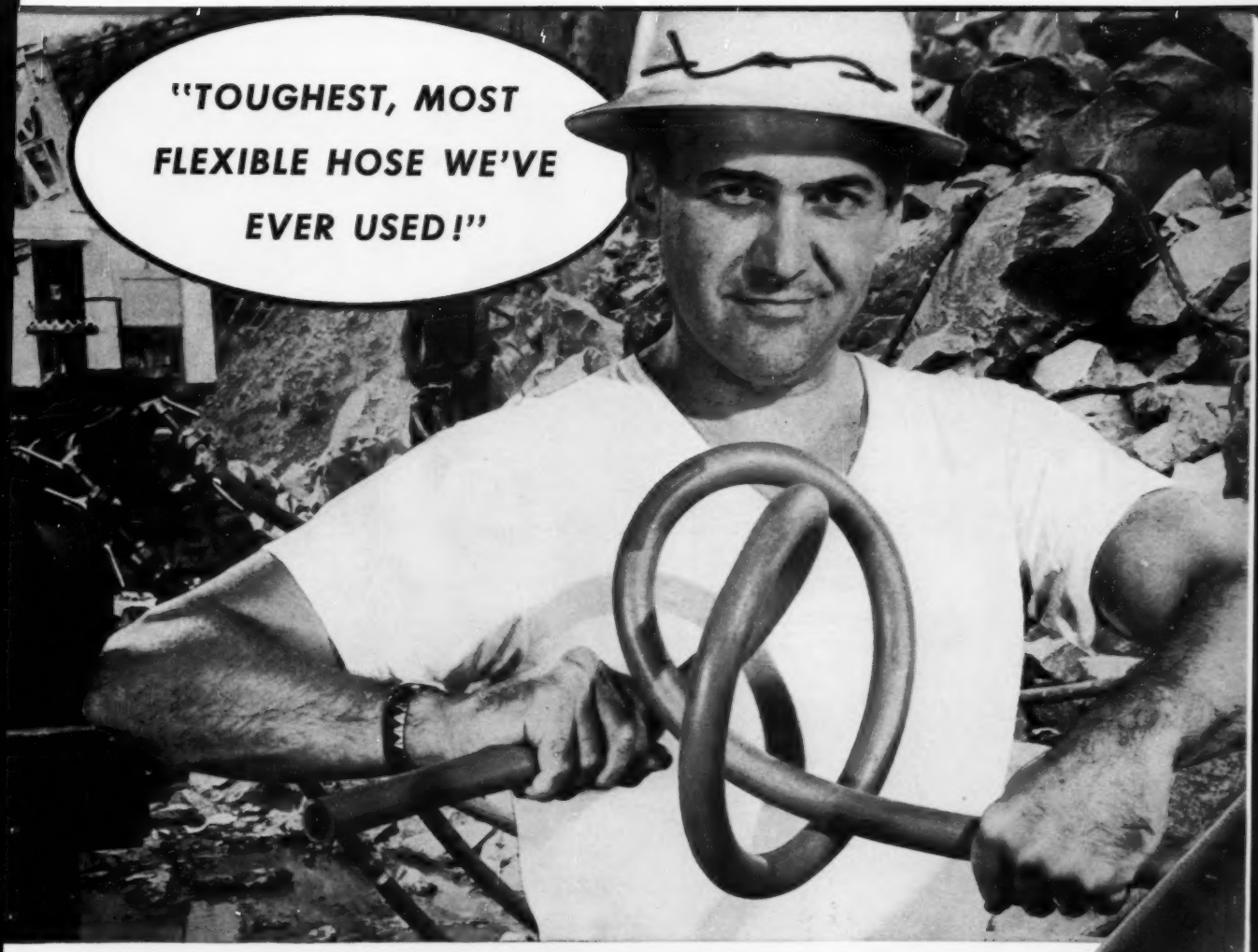

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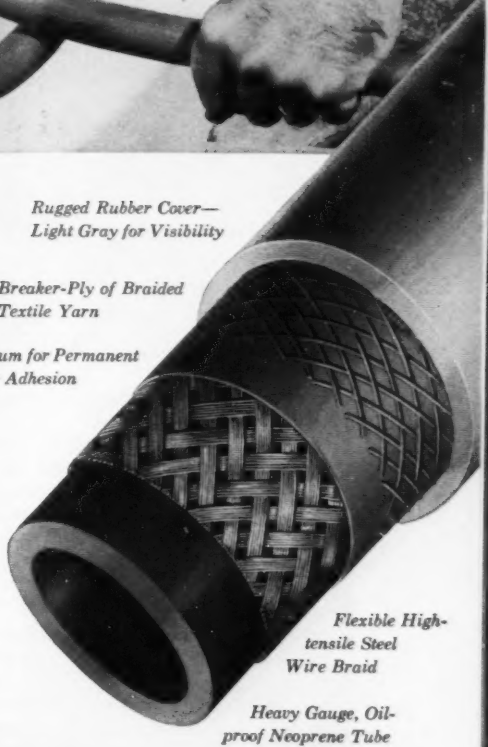
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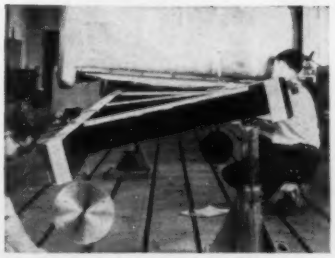

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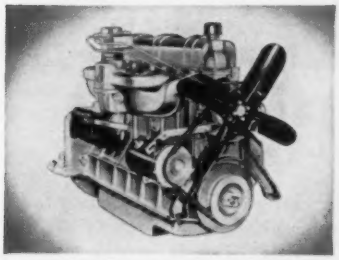
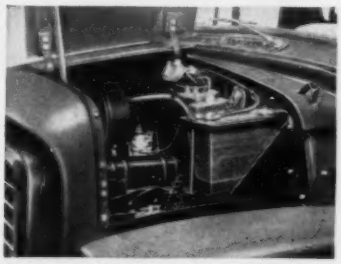
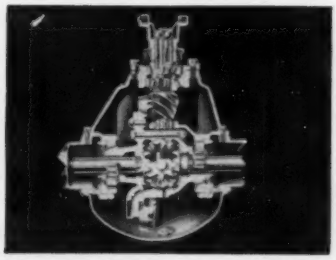


Dependable gasoline or LPG "six" power and economy backed by INTERNATIONAL all-truck engine leadership.



Easy servicing. Units in the wide engine compartment under the hood are located for quick, uncramped servicing.

Easy to handle in tight spots or on the roughest terrain with true geometric steering, cam and roller mounted gears.



Maximum load hauling, long life axles. Front and rear axles are full floating single reduction type.

INTERNATIONAL **Trucks** with *all-wheel-drive* are truck-built tough to make roads where there are none.

You get more traction, more sure-footed power because *all wheels are working.* They move you over sinkholes, mud, sand or snow . . . they grab hold to pull business-sized loads up the steepest grades.

What's more, *every* all-wheel-drive INTERNATIONAL Truck is all-truck manufactured in one plant. You get dependable performance that makes the most out of every workday, plus lasting economy of operation and long life. That's why INTERNATIONAL Trucks cost *least* to own. Fleet cost records prove* it.

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**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

cost least to own!

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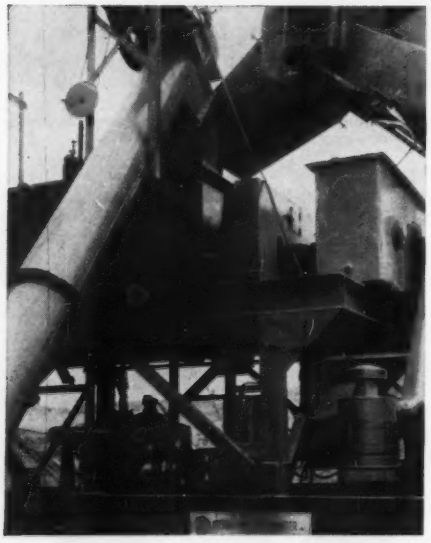
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

to provide accurate proportioning and control of base materials in large capacity operations



To provide . . . in large capacity operations—the more accurate proportioning and control of base materials which so many state highway departments are requiring, H & B engineers have developed two new Stabilizers, to provide capacity up to 400 cu. yds. per hour.

Both of these Stabilizers are unit type plants, with individual units operated by electric drives. The feeder, mixer, and aggregate conveyor are wheel mounted, to permit operation in running position without jacking up or cribbing. The units include:

FEEDER: equipped to proportion two sizes of aggregate onto belt.

AGGREGATE CONVEYOR: belt type, carrying aggregate from feeder to mixer.

MIXER: Twin shaft, continuous pugmill type, driven by Diesel power unit, and equipped for introducing water into mix.

CEMENT CONVEYOR: electrically driven, with variable speed drive, permitting accurate control of proportioning.

ELECTRIC DRIVES: permitting the feeding of aggregate, cement and water to be started and stopped simultaneously with one push button.

Complete information on either of these Stabilizers will be furnished on request.

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Fleet Keeps Job on Schedule

CONSTRUCTION SCHEDULE for 512-ft high Swift Dam—highest earthfill dam ever attempted—allows just 30 months from the start of construction to first power generation. And because of necessary preliminary work, the contractor for the dam actually has only about 18 months to build the 15,300,000-yd fill.

Yet with about half of those 18 months past, the job is right on schedule. A joint venture of J. A. Jones Construction Co. of Charlotte, N.C., and Charles H. Tompkins Co. of Washington, D.C., has assembled a fleet of earthmoving rigs that can place more than 1,000,000 cu yd of fill a month at peak production.

Construction of the big earthfill dam on the Lewis River in

AT THE BORROW PIT—Manitowoc 4500 with a 6-yd bucket averages better than 600 cu yd per hr. It digs against a vertical cut face to blend the sedimentary fill material.

ON THE FILL—Euclid trucks and bottom-dump wagons spread fill in 15-in. layers. Nearly all of the hauling units on the job are sideboarded to increase their capacity.

Washington is strictly a truck and shovel job. Jones-Tompkins has 10 shovels and draglines feeding a fleet of more than 50 Euclid end-dump trucks and bottom-dump wagons. The schedule calls for 48,000 cu yd a day at full production, but on several days more than 60,000 cu yd of material has been placed in the embankment.

First construction for Swift Dam, Pacific Power & Light Co.'s third major structure on the Lewis River, began in May, 1956, when Guy F. Atkinson Co., Inc., started excavation of the 2,990-ft, 32-ft-dia diversion tunnel that carries river flows around the left abutment. Atkinson's $1.8-million contract also included construction of the upstream cofferdam.

The Jones-Tompkins $18.3-million contract was awarded in the fall of 1956 so the joint venture was able to prepare detailed construction plans and assemble equipment to start work early in the 1957 construction season. The contract includes the dam, spillway, and power tunnels.

The dam is 412 ft high from the original streambed level to crest. A cutoff trench excavated 100 ft into streambed materials makes its total structural height 512 ft.

Actually, the contractor did not excavate these underlying materials completely to bedrock. Some 90 ft of riverbed gravels between the bottom of the cutoff trench and bedrock are sealed by a unique cellular steel pile underground wall. Interlocking H-piles with cells pumped out and filled with concrete form the 300 ft long curtain.

A tapered 30 ft high concrete cutoff wall tops the sheet pile curtain. And in addition the foundation of the dam is grouted for its full length.

An abundance of excellent fill material is one important reason for high production on the big earthfill. Most of the fill comes from a borrow area about 1½ mi from the site on the banks of Swift Creek. It is a natural sedimentary conglomerate material with almost no plasticity.

Because the material has almost no plasticity, it can be placed in all but the wettest weather—a big factor in an area where annual rainfall exceeds 120 in. And the fine grained conglomerate makes excellent core material with an extremely low compacted permeability.

The borrow material is available in such large quantity as compared with rock that it also is used for a large portion of the shell. The only difference between core and shell requirements is that at least 12% of the material going into the core must be finer than a 200-mesh screen. Fortunately, substantial portions of the borrow pit contain such a high percentage of rock flour.

Because of work on the cutoff wall, full fill production was delayed until mid-summer. July was the first month in which fill exceeded 1,000,000 yd. But Jones-Tompkins also placed more than 1,000,000 cu yd in each of the three following months.

During the worst of the winter —December, January, and February—the contractor expects to place 500,000 yd a month. The schedule calls for all fill to be in place by Oct. 31, 1958.

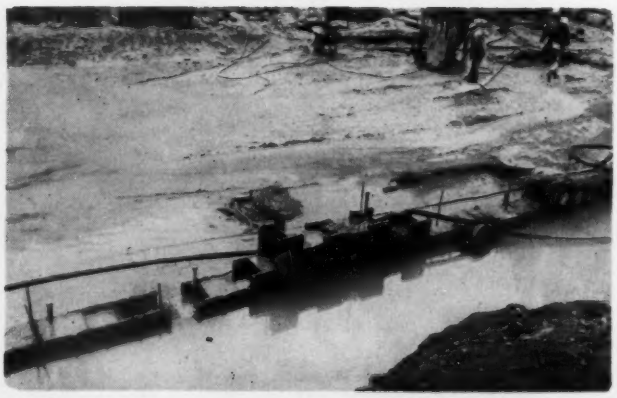
Digging the fill are nine shovels and one dragline:

- **1 Bucyrus-Erie** 38B with a 1½-yd bucket
- **1 Bucyrus-Erie** 54B with a 2½-yd bucket
- **2 Northwest** 80D's with 2½-yd buckets
- **1 Manitowoc** 3500 with a 3-yd bucket
- **2 Bucyrus-Erie** 88B's with 4-yd buckets
- **1 Marion 111M** with a 4-yd bucket
- **1 Manitowoc 4500** with a 6-yd bucket
- **1 Manitowoc 4500** rigged as a dragline with a 7-yd bucket

Shovels work against vertical cut faces 15 to 25 ft high. The sedimentary fill material is deposited in layers so the shovels automatically blend it as they dig against the vertical faces.

Production of the big Manitowoc 4500 shovel with the 6-yd bucket averages more than 600

Tapered Cutoff Wall Rests on Curtain of Piling



CUTOFF TRENCH—Streambed materials are excavated to a depth of 100 ft.

CURTAIN—Interlocking H-piles, driven 90 ft to bedrock, form an underground wall.

cu yd per hr. In fact, several times it has dug as much as 7,500 cu yd on a 10-hr shift.

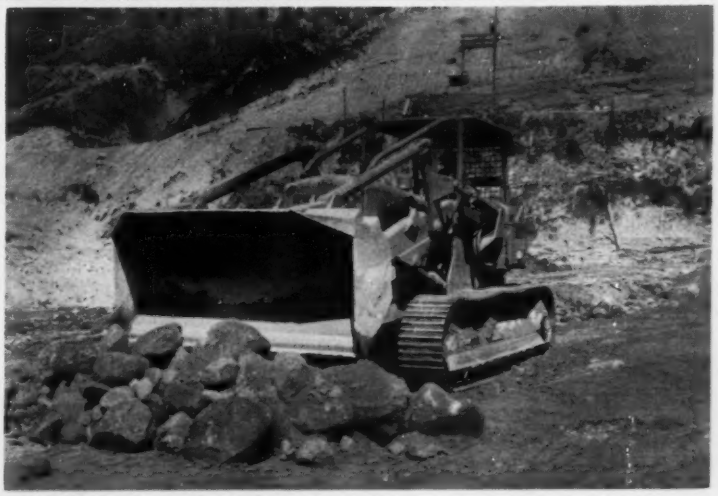
Both core and shell are spread in 15-in. layers and compacted to 12-in. thickness. Nearly all of the hauling units are sideboarded to increase capacity. Euclid end-dump trucks carry 15 yd; Euclid bottom-dump wagons haul 20 and 25 yd of fill.

Southwest 50-ton articulated rubber-tired rollers make four passes over the fill to compact it to specifications.

The fact that core and shell material are so similar presents a risk that the entire mass of the dam might become saturated. To prevent this, the design calls for a filter zone of carefully graded rock just downstream from the central core to drain off water seeping through so that the downstream shell will stay dry and not slough off.

Main part of the filter is a central drain 12 ft wide. J. N. Conley Construction Co. of Portland, Ore., produces the material for the filter—and the aggregates for the concrete. End-dump trucks haul filter material, and a small tractor with a winged bulldozer blade slightly less than the 12-ft width of the filter spreads it.

On each side of this drain are transition zones to prevent piping of material through the tight core and shell into the drain. The transition zones are composed of natural stream bed deposits that are well graded sands and gravels. The fine grain sizes are limited to not more than 5% passing a 200-mesh screen.



REMOVING BOULDERS—Allis-Chalmers HD-16 scoops up oversize boulders in borrow pit. Smaller boulders are hand-picked out of the fill and hauled to rockfill areas of dam.

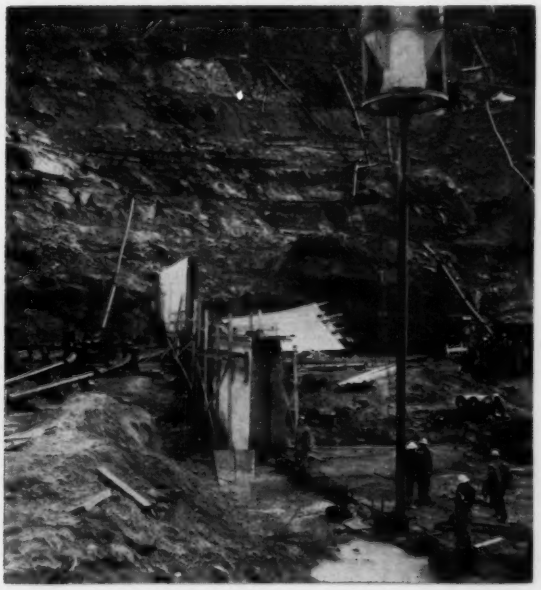
An 8-ft-thick rock blanket will be laid on the natural riverbed materials under the downstream shell to act as a continuation of the filter—in effect, a horizontal drain. And the upstream slope will be protected from sloughing by a rockfill on the upper part of the slope.

Axis of the dam curves upstream on a 4,600-ft radius. Crest length is 2,100 ft, and base thickness is 1,950 ft. In conjunction with the dam and its power plant is an afterbay powerhouse called Swift Powerhouse No. 2. A 3½-mi canal connects the discharge of the powerhouse at the dam with the intake of the afterbay unit.

Cost of the entire project, including both powerhouses, is pegged at about $70 million. Bechtel Corp., San Francisco, handled engineering design. Guy F. Atkinson Co. holds the $2.5-million contract for Powerhouse No. 1 and the $7.3-million contract for Powerhouse No. 2 and its connecting channel.

Men on the Job

For the Jones-Tompkins joint venture, Paul H. Swanson is project manager and W. H. Kennish is general superintendent. For Guy F. Atkinson Co. George McCoy is project manager. The Jones-Tompkins team has subcontracted the power tunnel, penstock, and surge tank excavation to A. J. Cheff Construction Co. of Seattle.



SEAL—Cells of the H-piles are pumped out and force filled with concrete to provide a seal.

CONCRETE WALL—On top the line of piling a 30 ft concrete wall extends into the core.

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NEARING COMPLETION—Sprawling aluminum plant on the Ohio River near Wheeling, W. Va., consists of reduction plant (background) and fabricating plant (foreground). Barge loads of alumina will be unloaded at dock and carried by conveyors to plant.

Good Organization of the Job Makes Complex Project Move

TOP-NOTCH COORDINATION is a main reason for rapid progress in construction of a sprawling $160-million industrial plant on the Ohio River about 35 mi downstream from Wheeling, W. Va. There F. H. McGraw & Co. of Hartford, Conn., has completed nearly 80% of the structural work. And they've been on the job only about 18 months.

The mammoth project consists of two main parts—an aluminum reduction plant and a rolling mill. The reduction plant will be operated by Ormet Corp., owned jointly by Olin Mathieson Chemical Corp. and Revere Copper and Brass, Inc. Olin Mathieson is sole owner of the rolling mill.

Each of these two main parts is so large that McGraw broke them up into areas, each under a superintendent. For overall coordination, McGraw set up a separate

DEEP FOUNDATION—Casting pits at reduction plant are built up with concrete, batched on the site, hauled in transit-mix trucks, then carried on long chutes to foundation.

TOUGH SITE—In early stages of excavation, working space is scarce. Here, a Lorain 1½-yd shovel loads an International dump truck while a Caterpillar grader dresses cut.

POURING FOOTINGS—Forms are set up quickly in holes excavated by backhoes. Concrete is chuted directly into forms. Excessive rains slowed progress on the job for months.

EARTHMOVING—Fleets of Caterpillar DW21 scrapers handle the bulk of the 7,000,000 cu yd of earth excavation on job. Half of the structures are built on compacted fill.

organization headed by a coordinating manager. This group expedites the movement of materials to the various areas, keeps track of equipment, and coordinates the many trades working in each area. It removes a large burden from the shoulders of field superintendents who have enough to do solving immediate construction problems.

The reduction plant will receive barge loads of alumina, towed up the Mississippi and Ohio Rivers from a new ore processing plant in Louisiana. Ingots of aluminum produced in the reduction plant will be shared by the co-owners, although the greater portion will be shipped right next door to the new Olin Mathieson rolling mill.

When McGraw started the job early in 1956, the plan of the project was far different from its present design. Olin Mathieson had envisioned a smaller rolling mill, supplied by its own reduction and ore processing facilities right at the site. But five months after construction started, Olin decided to make some drastic changes. The ore processing plant was moved to Louisiana, and the size of the mill and reduction plant were increased. At the same time, Revere moved in as a partner in the reduction.

The job was tough enough as originally planned. The revised program tripled the size of the project. Almost immediately work had to be halted in some areas and greatly expanded in others. Coordination was so tight that much design information was teletyped directly to the job to save time. More workers had to be recruited, and this was no easy task because the immense amount of industrial development along the river had drained the supply.

But McGraw engineers took it in stride; the job had been hectic from the start. The 1,100-acre site on the northern bank of the river was far from ideal for an accelerated construction schedule. When McGraw engineers moved in during the early spring of 1956, they faced the job of transforming the side of a high hill into a level industrial site. Finished elevation of the site was about half way up the hill. Above this line, more than 7,000,000 yd of earth had to be excavated, then hauled and placed in the low area

continued on page 164

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Illustrated: Daybrook Series 1040 Excavator Style Dump Body with Series 9C Hoist.

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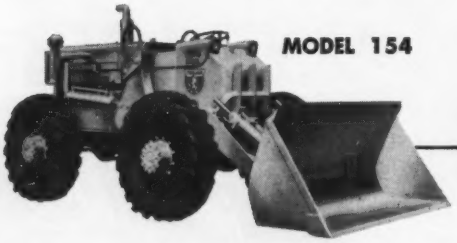
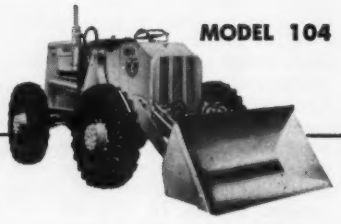


MODEL 154



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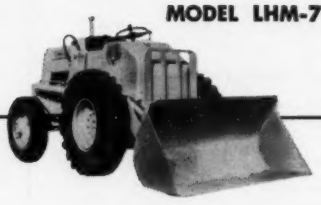

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FOUNDATIONS—Even though steel shipments were delayed, the contractor went ahead with footings and foundation slabs for the sprawling reduction plant.

WATERPROOFING — Foundations are sealed with long strips of plastic film.

of the site bordering the river.

To complicate matters, about half of the 35 acres of structures were designed to be placed on the fill; the other half go on the excavated section. The tight schedule allowed the contractor no breathing spell between grading and construction. In fact, sheepsfoot rollers barely completed their last passes before backhoes moved in to excavate for footings.

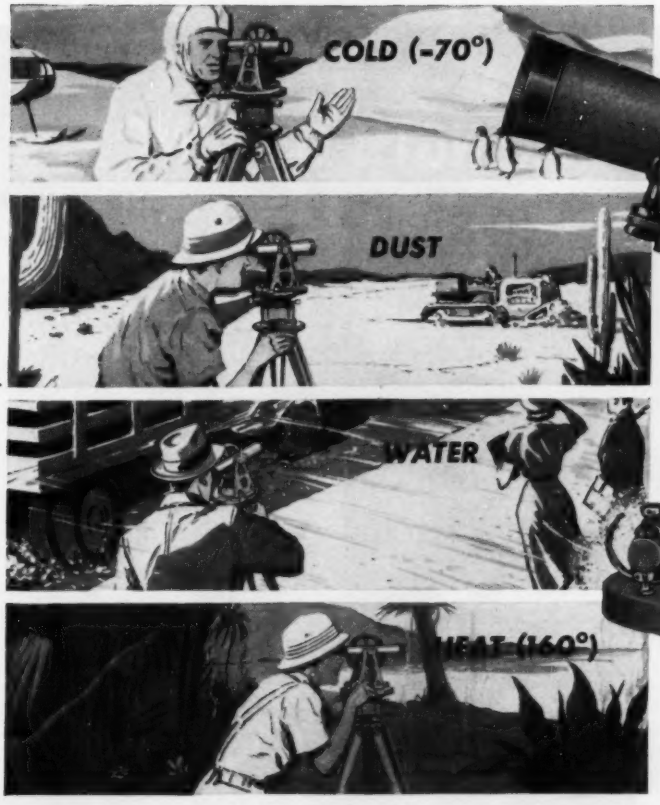
Virtually all of the 7,000,000 yd of excavation was handled with a fleet of about 30 scrapers. Half were drawn with crawler tractors, the other half were self-propelled. Along the contour line on the hill that marked the elevation of the site, hauls were short, and the tractor-drawn pans proved their worth.

As the job progressed, excavation moved further back into the hill, and haul distances increased to several thousand feet. Maintaining a production of 12,000 yd a day was tough. Excessive rainfall often turned cuts into quagmires, and the contractor was forced to jump all over the excavation area to find workable sections. Sometimes to get to the fill, scrapers had to maneuver through areas already pock-marked with foundation holes.

But self-propelled scrapers push-loaded by Cat D9's hauled around the structures to place the 30-ft fill. Material was laid in 6-in. lifts and compacted by the tires and tracks of the big rigs. Only in difficult areas were sheepsfoot rollers needed. The real key to effective fill construction was careful selection and blending of materials in the cut.

Because of the topography of the site, grading was completed first in the shallow cut and fill area that runs through the center of the job. Here, the contractor set up temporary shops, began to store material, and started on foundations. Available space was at a premium. As soon as an area was leveled, something was moved in. There was no other available storage area on the site;

CIRCUS TENT—To start brick work in oven area even before building is completed, the contractor rented a giant tent to keep out the weather and accelerate the job schedule.



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This new dormitory, constructed in Alfred, N. Y. for the New York State Dormitory Authority, illustrates the point. Its reinforced concrete foundations, floors and arches were poured during the winter season.

With Lehigh Early Strength Cement, the concrete reached service strength in less than half the usual time—and winter construction costs were cut all along the line. (On forms and labor alone, for example, the contractor estimated savings of $2000 and $1500 respectively.)

Remember Lehigh Early Strength Cement when planning winter concrete work. On large jobs and small, chances are it will save *you* time and money.

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Plans Architect: Urban, Brayton & Burrows, New York City, N. Y.
Contractor: John W. Rouse Construction Corp., Gouverneur, N. Y.
Ready Mix concrete supplied by: L. C. Whitford Co., Alfred, N. Y.

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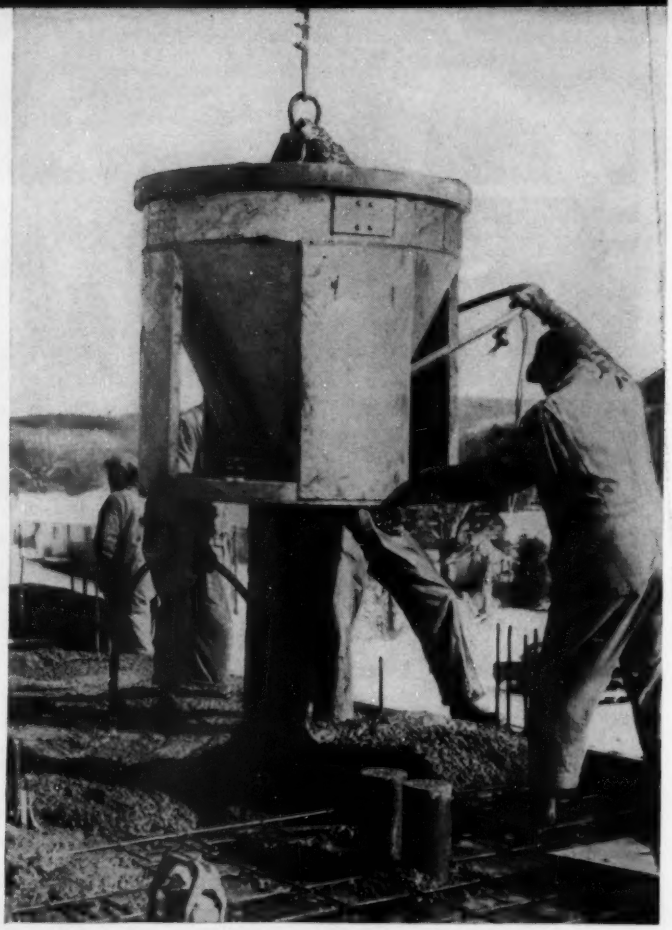

Pouring floor for new Alfred Agricultural and Technical Institute Dormitory.

Lehigh Early Strength Cement helped contractor save on form, winter curing and overhead costs.

Brick walls with concrete block backup for this 300 student dormitory were laid up with Lehigh Mortar Cement.

TRENCHING—Sewer and pipeline work is carried out after structural frame is up, permitting maximum amount of work inside and outside plant. Here, Lorain 1-yd hoe works inside the frame of a building to dig a part of the 8-mi sewer system at the big plant.

GOOD ORGANIZATION MAKES PROJECT MOVE . . . continued

every area was either a cut or a fill.

Foundations went in fast. Backhoes dug the holes, simple wood forms were placed, and concrete was chuted directly in place. All concrete was batched on the site and hauled in ready-mix trucks.

As soon as possible, American Bridge Division of U. S. Steel Corp. moved in and began erecting steel. McGraw wanted to get the structural frames and their coverings up at top speed because then the permanent overhead

HEY! YOUR SLIP IS SHOWING!

And *your* slip is showing, too, when your crawler tracks start spinning.

But you can restore full pulling power to your worn grousers in less than 30 minutes in the field with MARQUETTE's Tractor Strip "retread."

And you can save 30% or more – up to $400 – of the cost of a new set of grousers by using easy-to-weld Tractor Strip. Often, it lasts longer than original grouser bars! Sizes available to fit *all* tracks.

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MARQUETTE MANUFACTURING COMPANY, INC.
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GOOD ORGANIZATION MAKES PROJECT MOVE . . .

continued

cranes could take over the handling and placing of forms, concrete, and permanent equipment and fixtures within the buildings.

No time was wasted laying utility lines under the sprawling structures. The big push was to get the buildings up so that much of the complicated mechanical and electrical work could begin. Not that this meant the utility lines could be forgotten even temporarily. It would have been disastrous to try snaking miles of pipelines through the site later if adequate preparations had not been made. But McGraw's superintendents made provision for later installation of the utility lines by leaving out walls or adjusting footing grades at critical points.

OVERHEAD CRANE—Main section of one overhead crane is unloaded in rolling mill by another 100-ton overhead crane. Permanent cranes handle installation of equipment.

Despite the complexity of the job, structures and equipment are going in on schedule. When material or equipment delays threaten to hold up work in one area, the contractor works around it to keep the job moving. At the reduction plant, for instance, structural steel was late in arriving. Instead of waiting, McGraw went ahead and laid rows and rows of floor slabs and placed hundreds of heavy reaction pots with mobile cranes. Normally, this job would have been reserved for the permanent overhead cranes in the structure.

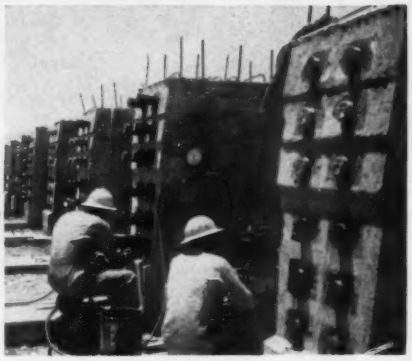
Mobile cranes play a vital role in the fast construction of the huge plant. McGraw employs about two dozen rigs, mostly on rubber, and they do everything from excavation to equipment placing.

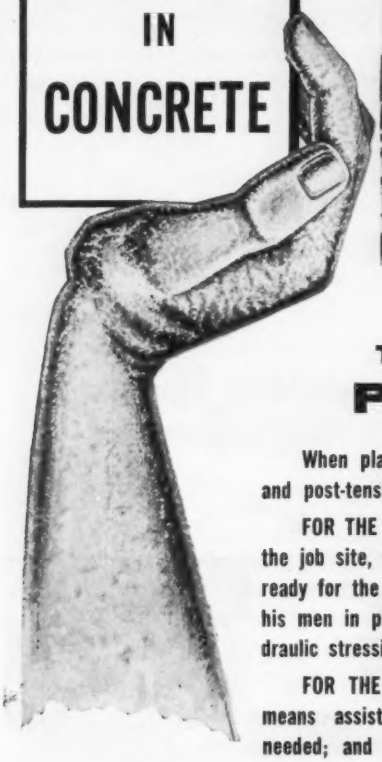
Liberal use of aluminum is made in all structures. Both the reduction plant and rolling mill are sheathed in aluminum sandwich panels, and all electrical bus bars are aluminum.

Personnel

John Galley is project manager, A. E. Spohn is deputy project manager, and R. C. Oppel is general superintendent for F. H. McGraw & Co.

MUSCLES IN CONCRETE





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When plans include members which are prestressed and post-tensioned—it pays to use the Prescon System.

FOR THE CONTRACTOR it means tendons delivered to the job site, completely assembled, clearly identified and ready for the forms; a Prescon representative to instruct his men in placing and stressing the tendons, using hydraulic stressing equipment—furnished by Prescon.

FOR THE ARCHITECT and CONSULTING ENGINEER it means assistance with design and engineering when needed; and assurance that Prescon can be specified with confidence.

Write for new folder giving complete, detailed information including examples of structures using The Prescon System.

THE PRESCON CORPORATION
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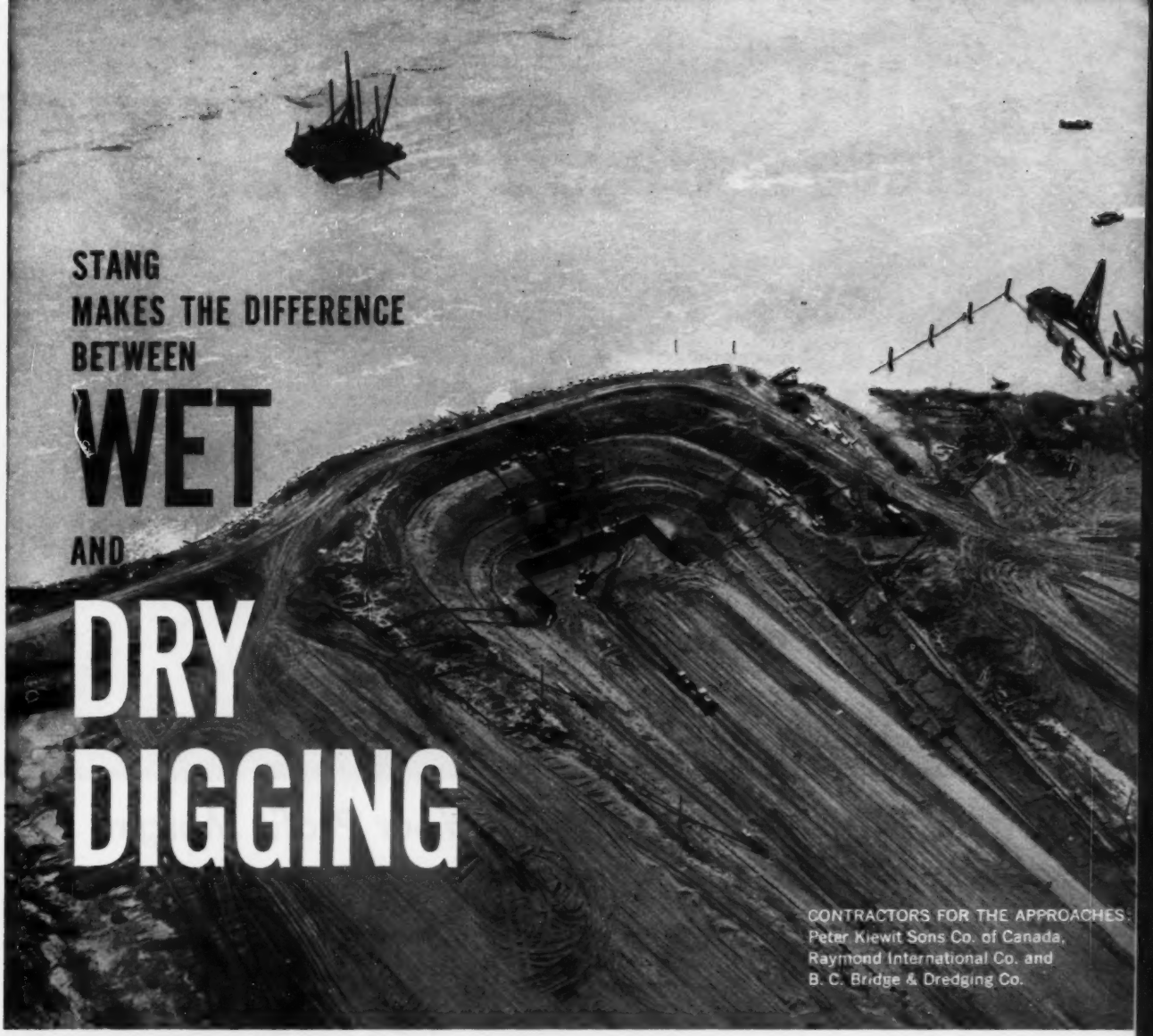
Member of the Prestressed Concrete Institute



Deas Island Tunnel approaches DUG IN THE DRY—thanks to Stang dewatering

Taking the initial step in construction of Canada's first subaqueous highway tunnel, which joins Deas and Lulu islands in the province of British Columbia, contractors for the approaches to the Frazer River called for dewatering by the John W. Stang Corporation. In record time, Stang engineers designed and had operating a deepwell turbine system on the Deas Island side and a wellpoint system on the Lulu Island side, making the excavations on both island approaches COMPLETELY DRY TO A DEPTH OF FIFTY FEET, AT THE VERY EDGE OF THE RIVER.

On any project, you can depend on Stang to start the job right—IN THE DRY. Remember, the responsible handling of water, in any situation, is Stang's sole business. Don't fight water, and lose time and money doing it. For the practical, economical answer to all your water problems, call on water-handling specialists . . . call on STANG!

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Here's why TWINS

Euclid Twin-Power Protects Your Profit Margin

21% faster than single engine units

In loading ripped and shot rock for the 1,300,000 yd. U. S. Highway job at Meacham, Oregon, two "Twins" saved better than 6 cents a yard over single engine rigs for Rogers Construction Co.

"Couldn't be done with scrapers"

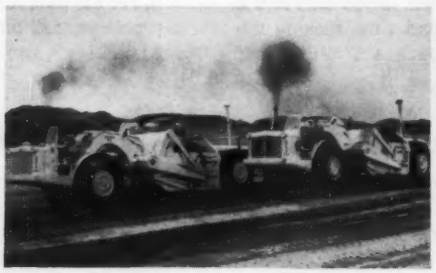
In Delaware, Barney Zinick tackled a million yard riverbank stabilization and bridge approach project with 5 Euclid "Twins"—moved 4000 yds. per shift over a 3000' haul—although the Corps of Engineers figured it would be a dragline job.

Handles complete road job

The first rubber-tired scraper for R. L. Eatherly Construction Co. of Nashville was a Euclid "Twin". In 4 weeks this one rig handled all earthmoving, grading and surfacing (50,000 yds.) for a state road connecting U. S. 70 with Oak Ridge.

Only "Twins" could operate

Heavy rain did not stop "Twins" from loading clay and sand for L. W. Edison's 2 million yard expressway project at Grand Rapids, Michigan. This contractor rates the "Twin" as the most efficient scraper available today.



Averaged 350 yds. per hour

Bidding on "Twin" performance, N. A. Degerstrom beat 23 contractors and wet weather . . . moved 14,500 yds. in 31 working hours on one section of the 900,000 yd. job near Davenport, Washington.

Self-load at 10,000 ft. elevation

Two "Twins" are stripping overburden at J. R. Simplot Company's phosphate mines in Idaho. They self-load, climb 50-60% adverse grades on the return, and move as much as 300 pay yards per 50 minute hour.

are moving the cheapest dirt!

"EUC" TS-24 outperforms any other scraper

Combine two engines (300 h.p. in front and 218 in back), two synchronized Torqmatic Drives, all wheel drive, and job-proved Euclid hydraulic scraper operation with 24 yd. struck capacity and you have the most productive scraper in the field today . . . the TS-24 Euclid "Twin".

Many other design features like 4-section cutting blade, extra-strength construction, easy-loading bowl design, planetary drive axles, NoSpin differentials and 27.00 x 33 tires (33.5 x 33 optional) contribute to the unmatched performance of "Twins".

On job after job—small grading work to big yardage projects—Euclid Twin-Power Scrapers have moved dirt at lower cost than other scrapers. They can do the same on your jobs and protect your profit margin in spite of rising costs. Your dealer has job studies with actual production and cost data that will be helpful—just ask for "Twin Facts".

Be sure to check your dealer's schedule for showing the new color film "Memo to the Winning Contractor"—in less than half an hour you'll "visit" a wide range of jobs and see for yourself why "Twins" give you a big edge in bidding.

30% more payloads

Working with single engine scrapers at the Jackson, Alabama Lock and Dam project, a "Twin" bulled through adverse material that delayed other scrapers, and moved almost a third more payloads.

42 "Twins" on Toll Road

On the Illinois Toll Road where bidding competition was keen, eight contractors have put a total of 42 "Twins" to work. "Twin" performance is helping overcome wet weather conditions that stop other scrapers.

3500 yds. in 10 hours

For expansion of Vancouver Island airport runways, Hassel Bros. Ltd. used two "Twins" . . . overcame weather delays and adverse conditions. . . . moved 7,000 yds. in a 10 hour shift, self-loading clay and gravel.

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Your Euclid Dealer offers the best equipment investment

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EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

New advantages for truck owners introduced in all-new Dodge Power Giants for '58

Power, payload, economy and styling features make Dodge 4-way leaders of low-priced 3

Recent introduction of the new '58 Dodge *Power Giants* brings truck owners a series of the most outstanding advances in Dodge truck's 40-year history.

In power, for instance, Dodge offers three new *Power Giant* V-8's that provide up to 234 hp. . . . as much as 24% more than other low-priced makes. These extra-powered engines can take it easy under normal loads . . . keep going longer, too.

Payload capacities are up to an all-time high. Chassis construction features the elimination of excess weight while actually increasing strength. You get as much as ⅓ more payload capacity.

When it comes to economy, Dodge sweeps the field because of its exclusive Power-Dome V-8 engine design that reduces harmful carbon deposits. This improves gas mileage . . . practically eliminates the need for major engine overhauls.

Dodge styling gives truck owners a real prestige bonus. Striking dual headlights, massive new grilles and luxury cabs are exceptional highlights.

All in all, truck owners would be well advised to check into the '58 *Power Giant* line-up before replacing or adding units. These Dodge trucks are definitely four-way leaders of the low-priced three.

DODGE *PowerGiants*

Construction Men in the News . . .

Beavers Honor Nine Western Builders

THE BEAVERS, an organization of western heavy construction men, made awards to nine leaders in the industry for "outstanding contribution to construction" at its third annual Golden Awards dinner in Los Angeles. Those honored were:

In Management

JOHN C. MAGUIRE of J. C. Maguire & Co., and LESTER S. COREY of Utah Construction Co.

Maguire, in construction for more than half a century, started in the contracting business at Salt Lake City in 1907 as a partner in Strange and Maguire. In 1913 he moved to Butte, Mont., and established his own firm specializing in street paving and highway construction. His first venture in dam construction came in the early thirties when, in association with L. T. Lawler of Butte, he became a partner in a joint venture that built Seminoe Dam on the Platte River in Wyoming. Other dams he has worked on include San Gabriel Dam No. 1, Shasta, Bull Shoals, and Canyon Ferry.

Corey joined Utah Construction Co. in 1901 as a timekeeper and became president of the company in 1934. He retired in 1954.

Corey's career includes the building of railroads, dams, and other major projects both in the United States and abroad. In joint ventures he worked on Hoover, Bonneville, Grand Coulee, Davis, and Imperial dams, the New York Aqueduct, and numerous shipyards and industrial plants.

In Supervision

RALPH M. CONNER of Morrison-Knudsen Co., and ANDREW E. GRAHAM of Pacific Bridge Co.

Conner has a career behind him that runs from 1906 through 1950 when he retired. It includes work as a construction superintendent with many private companies and a 15-yr stay in heavy and dam construction with the Morrison-Knudsen Co.

Graham began his career with Pacific Bridge of Portland, Ore., operating a rock crushing plant. His work on a number of bridge pier jobs won him a reputation as an expert on subaqueous foundation work and led to his building of the piers for San Francisco's Golden Gate Bridge. A mural in San Francisco's Coit Tower honors his part in that project and stands as a symbol of the construction industry.

He was in charge of the building of two graving docks at Pearl Harbor when the Japanese struck in 1941. He later headed much of the salvage work that followed the bombing, remaining at Pearl Harbor through most of the war. For this work, Pacific Bridge Co. was awarded the Army-Navy "E", and Graham received three Presidential citations.

In Engineering

ROSS WHITE of Brown & Root and HAROLD E. HEDGER of the Los Angeles Flood Control District.

continued on next page

In Management

JOHN C. MAGUIRE
A dam builder

LESTER S. COREY
Former president of Utah

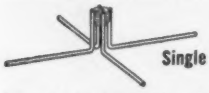
In Supervision

RALPH M. CONNER
A Morrison-Knudsen super

ANDREW E. GRAHAM
Pacific Bridge's pier expert

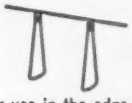
How to lift and anchor pre-cast slabs

Pouring the slab is only part of the job... it's still necessary to get it into place. You have to select, place and use proper tilt-up accessories to do this. With the proper Sure-Grip accessories, you handle slabs easier, safer and more economically. Cranes aren't tied up, men aren't standing around and slabs aren't damaged. Sure-Grip accessories will be your biggest "help" on your job.



Single Pick-Up Insert

For use with 1", 1¼" and 1½" coil bolts. Helix coil forms the nut and specially chased coil bolts are threaded into it. Safe loads in tension for 3,000 PSI concrete are 7,000 lbs. for 1" bolt, 8,000 lbs. for 1¼", and 9,000 lbs. for 1½" bolt. Double pick-up inserts using two 1" coil bolts 12" on centers have 11,000 lbs. safe load.



Double Loop Insert

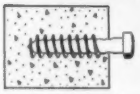
For use in the edge of the slab. Safe working loads in shear up to 6,000 lbs. with 1" bolts, lifting angles and 3,000 lb. concrete.

Brace Anchor

All Sure-Grip anchors set only ¼" below the slab face. They give anchorage for braces in both the slab to be lifted and the floor slab on which the base of the brace rests. Types available for use in slabs to be raised, formed floor slabs, floor slabs poured on fill and where braces are attached to the underside of slab to be raised.

Sure-Grip also makes temporary slotted setting studs, lifting angles and slab braces.

Screw Anchors and Bolts



Used for temporary anchorage for steel tunnel forms, false work support brackets, cantilever steel forms for gravity dams, etc. Also for permanent anchorage for cleats, fenders, column bases, seat brackets and for lifting concrete slabs, beams and piles. Bolts can be removed and reinserted.

FREE — Mail the coupon below for 48 page illustrated catalog of concrete accessories and name of your nearest Sure-Grip dealer.

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Without obligation, send me your **free** 48 page catalog and the name of my nearest Sure-Grip dealer.

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In Engineering

ROSS WHITE
Brown & Root's vice president

HAROLD E. HEDGER
Water conservationist

White spent three years as a construction engineer in the Philippine Islands before beginning a long period as an engineer on dam construction. California was the scene of his first, the Don Pedro Dam. Several more followed, then White began an important series of Tennessee River Dams for TVA and others.

He has been since 1942 vice-president of Brown & Root in general charge of heavy engineering construction, a role that has taken him through half a dozen dams as well as bridges, tunnels, and defense projects both in the United States and abroad.

Hedger made his career close to his home in California. His work with the Flood Control District of Los Angeles began in 1924 and led to his becoming chief engineer for the district, a post he has held since 1938. In this position, Hedger directs the operations of an agency with an annual budget of approximately $40 million for construction and operation of flood control and water conservation projects. He recently made an official trip to India to help that country establish a flood control system.

In Supply

R. G. LETOURNEAU of the R. G. LeTourneau Co., for 30 years a leader in the design and development of heavy construction equipment, and GUY C. KIDDOO of the First National Bank of Chicago, often called "the contractor's banker."

Special

L. N. MCCLELLAN, chief engineer of the U.S. Bureau of Reclamation, for his work on hydroelectric projects, including Hoover, Grand Coulee, and Shasta Dams.

P. J. SOUKUP, formerly general manager of Mannix Co., Ltd., Canadian constructors, is the firm's new vice president in charge of construction. He also becomes a member of the company's board of directors.

PERFECT TEAMWORK by two barge transported American Crawler Cranes spots a long truss section with accuracy and safety. This bridge is one of four that cross sloughs on the approach to an inter-state bridge over the Mississippi between Iowa and Wisconsin at Lansing, Iowa.

WHEN THIS SHORE-ASSEMBLED truss arrived at the job site, the American 700 Series Crane set it in place without additional help—falsework wasn't required! George Kenyon, 700 Series operator reports, "I especially like the American Cranes because of their easy handling and simplicity of controls. On pile driving and steel erection jobs this 700 Series American Crane performed extremely well."

CONTRACTOR USES AMERICAN CRANES TO SET TRUSSES WITHOUT FALSEWORK

Falsework was eliminated and considerable time saved when Brennan Brothers assembled truss sections ashore and carried them to the bridge site via crane and barge. The contractors reported that this important step couldn't have been done without the exceptional lifting power of their American 700 Series Crane that handled the heavy sections.

Working from individual barges the 700 Series and two 300 Series American Crawler Cranes drove piles and handled the variety of construction materials used on the $565,000, four-bridge project. The contractors reported: "We were especially pleased with the way the big American Crane handled the pile driving and truss setting jobs!"

No matter where you work American Cranes, their performance pays off with true efficiency and continued low cost operation. A complete line of versatile, dependable American Cranes in capacities from ½-yard, 12½ tons meet the demands of your toughest jobs from excavation through steel erection! Call your nearby American Distributor . . . he has complete facts.

EXCAVATORS-CRANES to 2 yds.-50 tons
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REVOLVER CRANES to 400 tons

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Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

(Advertisement)

How to make a Pony do a Plow-horse Job

New Allison CT-3340 brings TORQMATIC muscle for the first time to 7-yd. scrapers and small materials handlers.

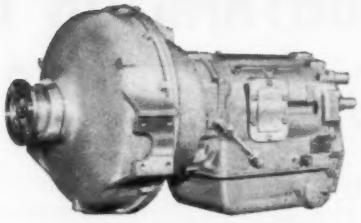
A scraper with TORQMATIC delivers more power at the blade – faster work cycles–more time on the job.

Any operator of a TORQMATIC-equipped giant scraper can vouch for that. Now, for the first time, the proved advantages of TORQMATIC are available in several small scrapers, haulers and other materials handlers with the new TORQMATIC CT-3340.

Take a tip from more than 80 manufacturers of 122 different types of construction and road-building equipment.

Get the Allison TORQMATIC story. Ask your equipment dealer, or write:

Allison Division of General Motors, Indianapolis 6, Indiana



- New "straight-through" design provides maximum capacity in minimum space.
- Full power shifts in all speeds: 4 forward, 2 reverse, including high-speed overdrive for return trips.
- Net torque input–350 ft-lbs.
- Multiplies engine torque 300%.
- Total torque ratio: 15.9:1.

Allison TORQMATIC® DRIVES

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Yale & Towne Mfg. Co.: Contractors Machinery Division has appointed the following three distributors for Trojan tractor shovels: McNall Machinery and Supply Corp. of Cedar Rapids, Ia.; Straits Engineering Co. of Sault Ste. Marie, Mich.; and The O. B. Avery Co. of St. Louis, Mo. Freeman Materials Handling Co. of Toledo, O., is a new distributor for the Materials Handling Division.

Diamond T Motor Car Co.: Two new truck distributors are announced: Ace Truck & Equipment Co. of Rochester, Minn.; and Motor Truck Equipment Co. of Cleveland, O.

Baldwin-Lima-Hamilton Corp.: The Construction Equipment Division has appointed Jeff Hunt Machinery Co. of Columbia, S. C., as distributor for Lima shovels, cranes, and the Roadpacker compactor for the state of South Carolina.

Viber Co.: The following three distributors of concrete vibrators have been appointed: Holland Equipment Co. of Salt Lake City, Utah; Construction Supply Co. of Celina, O.; and Northeastern Supply Co. of Cleveland, O.

Aeroquip Corp.: Construction Supply Co. of Celina, O. has been appointed an Aeroquip industrial products distributor.

Hewitt-Robins, Inc.: Southern States Equipment Co. of New Orleans, La., and Kimball Equipment Co. of Salt Lake City, Utah, are new distributors of conveyor equipment.

continued on next page

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS

Onan ELECTRIC PLANTS

Here's how Onan Portable Power pays you added profits!

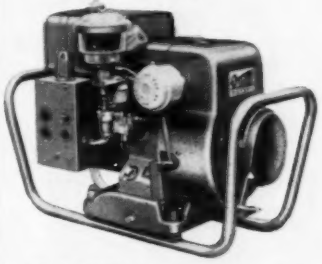
Gives you cost-cutting power on the job . . . *from the start*

Carry, truck or wheel in an Onan and you're all set with plug-in power for the whole crew. No wasting time with hand tools . . . no waiting for utility lines. If you're not using electric power *full time* chances are you're losing more money than the cost of several Onan plants.

4-cycle, season-long dependability

Onan plants are rugged . . . built to take abuse from weather and workmen. Special cast-iron block Onan engine and drip-proof all-climate Onan generator are direct-connected in a rigid, compact, smooth-running unit. Out-perform and outlast "assembled type" plants using general purpose engines. *Special contractor models from 500 to 10,000 watts.*

2500-watt model serves crew of 3!



Model 205AJ-1P, most popular Onan unit with residential contractors. Complete as shown with 4 plug-ins, pilot light, carrying frame, recoil starter . . . ready to run. Dolly-mounted model also available.

New folder helps you choose the right model for your job. Write today!

See your distributor for a free demonstration

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ELECTRIC PLANTS • AIR-COOLED ENGINES • KAB KOOLER • GENERATORS

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L-20 White ASPHALT PLANT

PAYS FOR ITSELF IN 38 DAYS!*

* $13,900 F.O.B. Elkhart is price of portable model illustrated. Stationary model, $13,400 F.O.B. Complete, ready to operate. Prices subject to change without notice.

Make your own hot mix asphalt with this new WHITE plant and save up to $2.30 a ton. At its capacity of 160 tons an 8-hour day, that's a savings of $368.00 a day. Thirty-eight of those days pays for the L-20!

Produce any type mix you can get from a $100,000 plant: hot, RC, MC, SC and emulsified for top course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 325 degrees.

The L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance.

See your nearest distributor or write direct for full information.

White Manufacturing Company, Elkhart 6, Indiana

F/S OPTICAL THEODOLITE

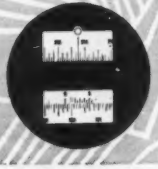
Model 4149

with Self-Indexing Unit

A time saving automatic feature ensures sufficient verticality of the main axis and accurate indexing of the vertical circle by simply centering a bull's eye level.

- Both circles viewed simultaneously
- Horizontal scale with optical vernier to 30 seconds. Vertical scale to 1 minute
- 25X Telescope, erecting
- Built-in Telescope vial
- Single-lever repetition control
- Servicing by factory specialists

F/S offers a complete line of high quality engineering instruments. Ask your nearest dealer or write today for detailed literature.



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SALES AND SERVICE . . .

continued

On the Sales Front

Yale & Towne Mfg. Co.: Contractors Machinery Division has appointed Fenton Hall as director of export sales, and John E. Becker as western regional sales manager for the Trojan line. The Division has also named the following district sales representatives: Harry Hennessey in Decatur, Ga.: John Sweatt in Batavia, N. Y.; Wesley J. Zorn in Glen Ellyn, Ill.; and Edward D. Gorton in San Leandro, Calif. In the Materials Handling Division George C. Lichty is now northwestern district sales manager.

Bucyrus-Erie Co.: Edwin T. Goree has been promoted to assistant general sales manager of the company. Harry Thornton becomes assistant eastern sales manager and Lewis C. Black has been named assistant general sales manager in charge of large machines and blast hole drills.

Nordberg Mfg. Co.: Robert E. Luebke has been appointed sales engineer for the Mining, Crusher and Process Machinery Division. H. W. Dow becomes manager of the New York office of the Engine Division.

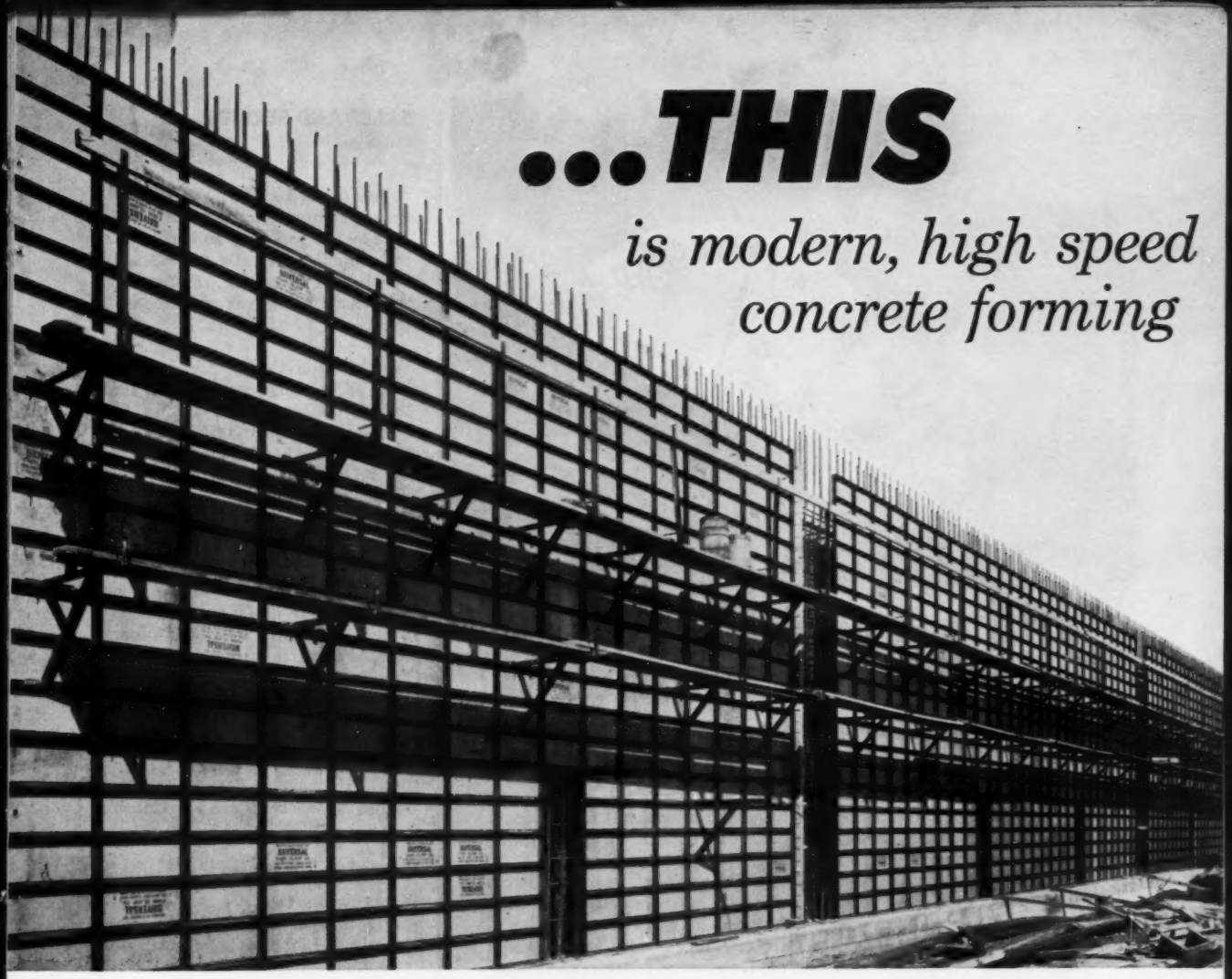
Lincoln Electric Co.: The following district sales office appointments are announced: Bruce N. Frye to Columbus, O.; Edwin Williams to Birmingham, Ala.; Gerald R. Stoeckinger to Los Angeles, Calif.; Paul McGonigle to Boston, Mass.; Richard R. Gould to Pittsburgh, Pa.; and Jerry Weiss to Detroit, Mich.

Thor Power Tool Co.: The following district sales managers have been appointed: A. V. Moroz, Chicago, Ill.; Alfred W. Escoffier, Seattle, Wash.; Walter B. Smith, Milwaukee, Wis.; T. E. Vocker, St. Louis, Mo.; H. L. Groves, Houston, Tex.; Martin A. Bertram, Cincinnati, O.; S. P. Gartland, Boston, Mass.; T. J. Murphy, Buffalo, N. Y.; and J. Q. Golden, Atlanta, Ga.

In the Main Office

Minneapolis-Moline Co.: J. Russell Duncan of Chicago, Ill., was elected president and chief executive office of the company.

continued on page 180



...THIS

is modern, high speed concrete forming

THIS IS UNI-FORMING... THE FASTEST GROUND-TO-GROUND SYSTEM

of concrete forming capable of handling virtually any type of poured concrete structure. UNI-FORMING is faster because assembly of UNI-FORM Panels with UNI-FORM Ties and Tie Keys is a simple mechanical (and automatically accurate) process . . . faster because minimum alignment and bracing is required on 1 side only . . . faster because every forming requirement is engineered into the system. In addition to its speed you'll find that the UNI-FORM System of concrete forming has many other advantages you can use to save time, money and labor.

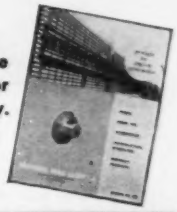
UNI-FORMING HAS 3 BASIC ELEMENTS

1. The UNI-FORM Panel is plywood faced, steel framed to provide strength and rigidity plus all the advantages of a nailing surface. Made in standard heights from 1 ft. to 8 ft.; widths 2 ft., 18".

2. UNI-FORM Ties lock and spread UNI-FORM Panels. Made for all wall sizes. Special ties available.

3. UNI-FORM Tie Keys securely lock Panels and Ties together.

Want more information on the UNI-FORM System? Write for new full line catalog today.



UNIVERSAL FORM CLAMP CO.

1238 N. KOSTNER • CHICAGO 51, ILLINOIS

CONCRETE FORM SPECIALISTS SINCE 1912

BRANCH OFFICES AND WAREHOUSES

SAN LEANDRO, CAL. 2051-9 Williams Street
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Universal Form Clamp Co. of Canada, Ltd., 226 Norseman St., Toronto, Ontario

CARCO WINCHES HANDLED TOUGHEST JOBS ON LARGE PIPELINE PROJECT

Three nationally known pipeline contractors shared in the difficult job of building the Pacific Northwest pipeline through the mountainous terrain between Umatilla, Oregon, and Chehalis, Washington.

All three of these contractors used Carco winches for towing, holding and lowering heavy equipment up and down grades that averaged around 50% to 55%.

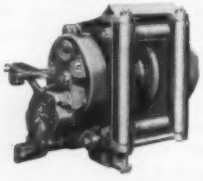
The Engineers Limited Pipeline Company of San Francisco, for example, used five International TD-24 tractors equipped with Carco Model J winches.

These husky, dependable Carco winches were continually called upon to perform tasks that only properly engineered and ruggedly built equipment could stand as a day after day diet.

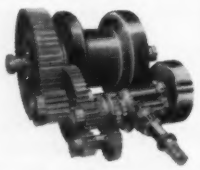
It's no small assignment to skid huge boulders out of the right of way, to tow, hold and lower heavy equipment like trenchers and backhoes up and down steep grades, to do the same for two tractors carrying joints of 26" pipe or large sideboom tractors, to tow and lower welders, coating pots and other jobs of like nature. Yet Carco winches did all these, took them in stride and asked for more.

Similar experiences are responsible for the fact that practical pipeliners everywhere know that Carco winches are thoroughly and completely dependable — in truth, are one of the most reliable pieces of contractor's equipment on the market.

See your nearest Carco dealer. He will help you select the model that best fits your needs. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.



Four roller fairlead, available at added cost for Model J, maintains maximum line pull while winching loads from any direction.



The Model J constant mesh 4-stage gear train, by high ratio of gear reduction, converts tractor power into line pull directly and efficiently.

Carco winches are nationally known for their efficient performance and dependability. That's why Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO®

SALES AND SERVICE . . .
continued

Johns-Manville Corp.: Adrian R. Fisher is now chief executive officer of the company following the retirement of Leslie M. Cassidy because of ill health. Fisher also replaces Cassidy as chairman of the board of directors.

Worthington Corp.: Admiral Arthur W. Radford has been elected to the board of directors of the company. Admiral Radford recently retired from the navy after 45 yr of service including two terms as Chairman of the Joint Chiefs of Staff.

Associations

Power Crane and Shovel Association: Officers for 1958 were elected at the recent annual meeting. President of the Association will be Arnold R. Corbett of the Unit Crane and Shovel Corp. Frederick Salditt of the Harnischfeger Corp. is vice president. Herbert S. Blake, Jr., continues as secretary and counsel.

Special Mention

Schield Bantam Co.: The company is starting a sales-service training school for distributor salesmen. This is the first time that a formal training program has been offered right at the plant. Classes started during the first week in January and additional three-day sessions are scheduled at regular intervals throughout the winter and early spring.

Clark Equipment Co.: The company has formed a combined equity and licensing agreement with Toyo Umpanki Co., Ltd., of Japan to manufacture industrial trucks and the Michigan line of construction machinery. Clark now has licensees in six foreign countries, having recently moved into England, Australia, France, Germany, and Belgium.

Prestressed Concrete

Reprints of the CM&E special report on techniques and equipment for prestressing concrete now are available. Single copies, 35¢; 10 copies or more, 25¢ each. Address orders to: The Editor, CM&E, 330 W. 42nd St., New York 36, N.Y.

LIMA

Users across the nation find LIMA Cranes tops in flexibility, speed and dependability

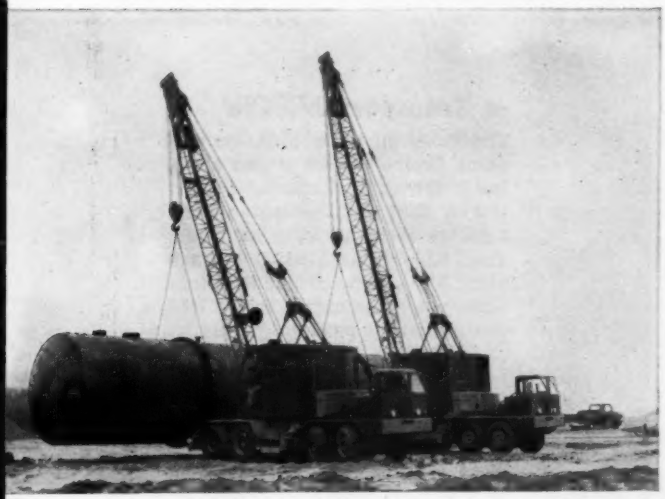
Two Lima Type 703-SC Cranes, equipped with 70′ booms and 20′ jibs, hoisting 110′ long steel girder weighing 76 tons on the construction of a bridge over the Calumet River.

If your job calls for lifting a hefty girder, placing concrete, handling loose material or what have you, you'll find that LIMA's advanced features give you the swift, smooth, dependable operation that spells profit.

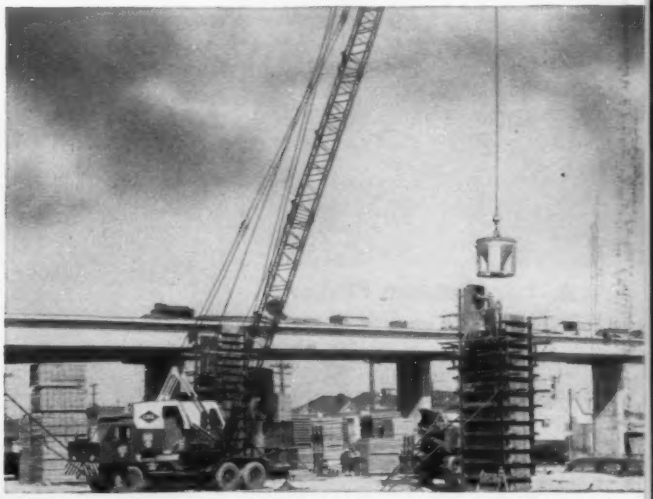
Here are some of the quality-plus features that help to make LIMA the outstanding crane for big and little jobs alike: *air-controlled clutches provide finger-tip control of all major operations; anti-friction bearings used at all important bearing points reduce wear and lessen lubrication problems; all gears, smaller parts and shafts which are subject to extra wear are flame or induction-hardened for longer life; big capacity drums and sheaves are easy on cables. There is a choice of three mountings, too—crawler, truck and wagon. Mounted on rubber for maximum mobility, LIMAs are available on 6 x 4, 6 x 6, 8 x 4 and 8 x 6 carriers with capacities up to 70 tons. If mobility is not a factor in your operation, you can get LIMA crawler-mounted cranes that will handle loads up to 110 tons.

Get the complete LIMA story from your nearby LIMA distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Optional on smaller types.



Two Lima Type 54-T truck cranes, equipped with 40′ and 50′ booms, setting 31-ton, 50,000 gallon capacity tank.



Lima Type 44-T Truck Crane pouring concrete into bridge pier form on the West Coast's largest freeway at Oakland, California.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

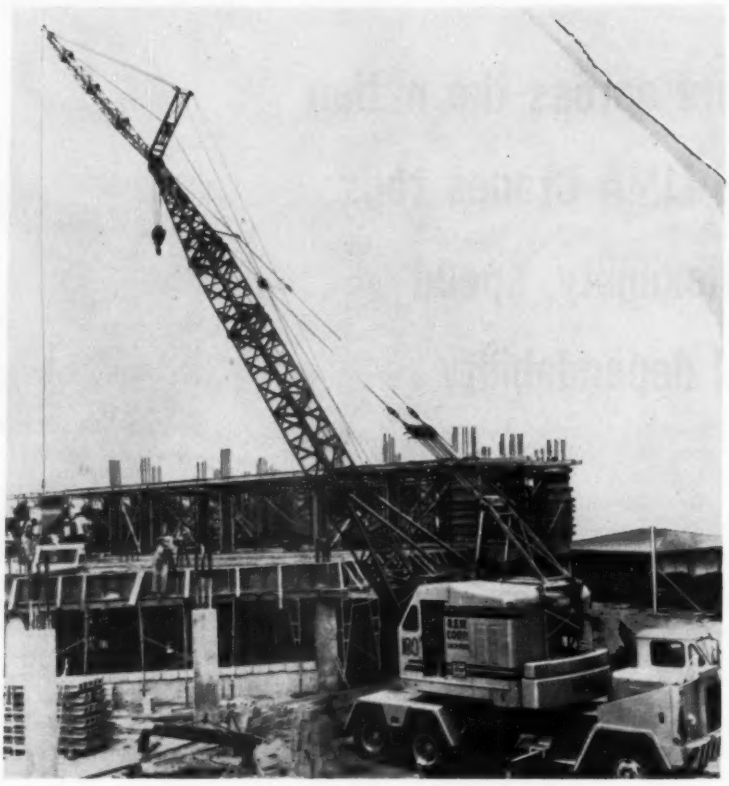
BALDWIN BLH LIMA-HAMILTON

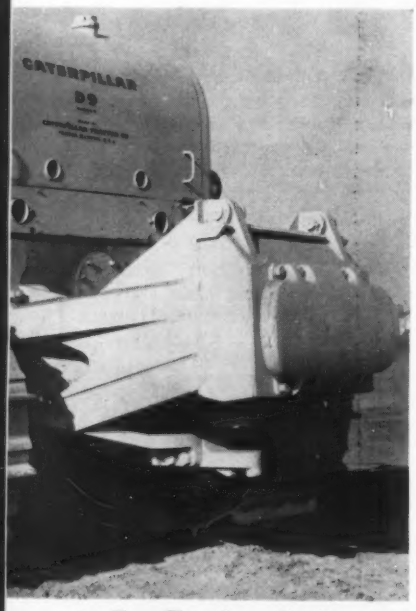
5816

Construction Equipment News...

Gar Wood Adds Crane

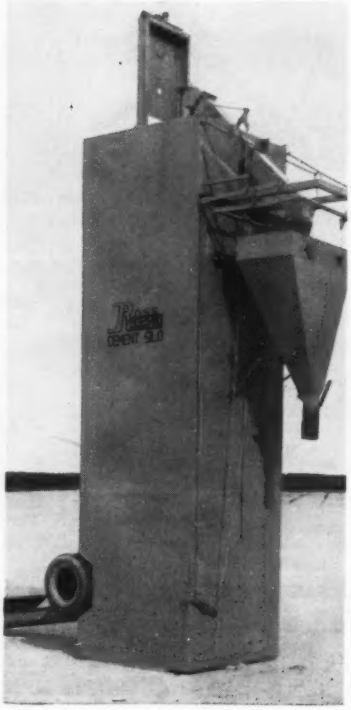
Latest addition to Gar Wood's line is a 25-ton truck crane featuring a hydraulically controlled counterweight system. A touch of a button lowers the counterweight until it straddles the main frame. In this position, the crane's hook block can remove it from the chassis. The crane also has a detachable outrigger system to lower weight for over-the-road travel. Live boom hoist, direct gear drive, a choice of 8 or 9-ft axles, and a machinery deck rigged for other attachments are other features.—**Gar Wood Industries, Inc., Wayne, Mich.**





▲ For Tandem Pushers

Tandem push loading of scrapers is economical and practical under the right conditions. Peterson has developed a push dozer and push block for Cat D9 crawlers to reduce the danger of sudden impact to the scraper, tractors, and operators. Both incorporate four shock-absorbing rubber cushions. The push block, which extends 50 in. behind the tractor case, is 36 in. wide, 19 in. high, and it weighs 2,770 lb. The cushioned 10-ft dozer blade has a ¾ in. thick, 48 in. wide reinforced center.—**Peterson Tractor & Equipment Co., San Leandro, Calif.**



◀ Transportable Silo

The Ross portable bulk cement plant, which can be towed along the highway by a standard truck tractor, is ready to operate within minutes after arriving at a job. The 220-bbl capacity storage plant has a hopper that falls into place when the unit is raised into the operating position. A built-in 30-hp gasoline engine supplies power to a 9-in. screw feed system that is capable of loading and elevating 150 bbl per hr. Dimensions of the plant are within the legal limits for highway travel in most states. Ready for traveling, it is 31½ ft long, 7 ft wide, and 12¼ ft high. In the operating position the silo is 25 ft high, 7 ft wide, and 7 ft long. It weighs 13,500 lb empty.—**Ross Porta-Plant, Box 446, Brownwood, Texas.**

▲ Compact Unit Places Hot Sealer Compound

Clipper's new model AC-40 hot-pour joint sealer combines equipment for melting and applying sealing compound in one compact unit that can be towed by a small truck. The joint sealer has a new type of pump that reduces maintenance while producing a smooth flow of material. Called the Moyno pump, it is said to be superior to piston or rotary-type pumps for handling abrasive fluids such as asphalt. The unit is powered by a two-cylinder, air-cooled, 18-hp Wisconsin engine that is propane-fired and equipped with a clutch and reduction gear. The trailer has three-point suspension. — **Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo.**

▲ Powered By Crawler

The 105TA Portadrill, which draws its power from the diesel engine of an Eimco 105 crawler, has two rotary compressors that produce 1,000 fpm to clear holes up to 9 in. of cuttings. Other features are a hydraulic mast and hydraulic jacks to stabilize the drill. — **Winter-Weiss Co., 2201 Blake St., Denver 5, Colo.**

Big But Portable ▶

Big, automatic, and portable—these are the attributes of Madsen's 481 asphalt plant. The plant includes a four-compartment, 50-ton bin with three openings in each compartment to speed charging of the 100-cu-ft weigh-box; a twin-shaft pug mill mixer rated at 6,000 lb; and a 96 in. dia, 40-ft long dryer. By pressing a single push button, the operator weighs out four aggregate sizes and asphalt, discharges aggregates to the mixer, injects asphalt, wet mixes, and discharges into dump trucks. A selector button provides a choice of three mixes. All components are fitted with transportation wheels. — **Madsen Works, Baldwin - Lima - Hamilton Corp., Box 38, LaMirada, Calif.**

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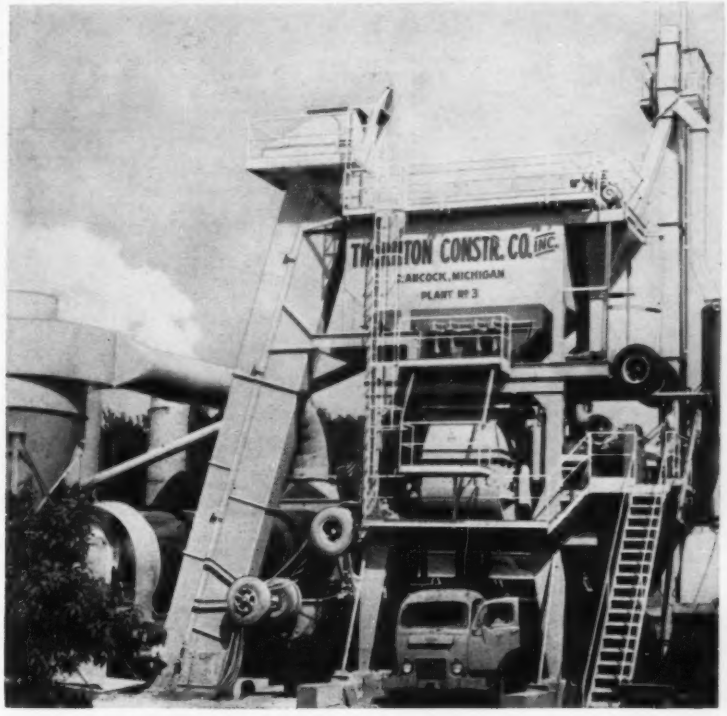
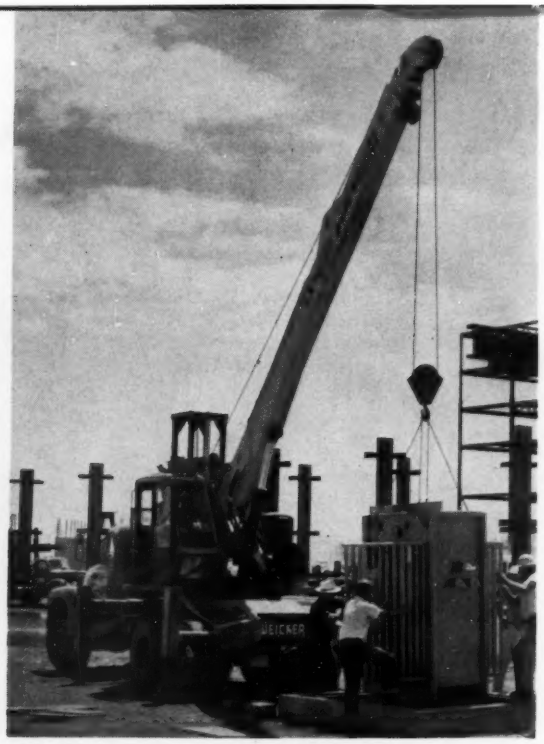


Semi-Automatic Welder is Portable

One man can move the 70-lb Wear-O-Matic Feed Unit in the field or shop, thus making it possible to use a semi-automatic open arc on hardfacing jobs usually handled by stick electrodes. To hold down weight, wire is fed to the dc welder from Payoffpaks, containers that do not mount on the welder. The feeder, including nozzle and tip, sells for $279.—**Alloys Rod Co., Box 1828, York, Penn.**



H-5 Hydrocrane Now Lifts 12 Tons

The addition of a bigger boom hoist, stronger outrigger boxes, and 1/3 more hydraulic power has boosted the capacity of the Bucyrus-Erie H-5 Hydrocrane to 12 tons. Another hydraulic circuit has been added, giving the H-5 three independent circuits—each supplied by its own pump. The telescopic boom extends to 50 ft and retracts to 26 ft. **—Bucyrus-Erie Co., South Milwaukee, Wis.**

Yale & Towne Introduce Biggest Trojan Tractor-Shovel

The largest Trojan tractor-shovel, a 4-yd machine weighing 40,500 lb, has been introduced by Yale & Towne. The four-wheel-drive tractor-shovel features an Allison Torqmatic transmission and Timken-Detroit planetary axles with a torque-proportioning differential. It is powered by a 240-hp GM diesel. Travel speeds range from 3.5 to 20 mph, both forward and reverse. Other features include powered steering and four-wheel air brakes. Dumping clearance is 10½ ft.—**Yale & Towne Mfg. Co., Contractors Machinery Div., Batavia, N.Y.**

continued on page 187

Muck 30 feet deep where a road must go!

...BUT GERKE AND CITIES SERVICE KEEP THE JOB ON SCHEDULE

North of Ladysmith, Wisconsin, Route 27 was practically floating in the swampland it cut through.

To Lawrence Gerke—sometimes known as "Gerke from Merrill"—went the difficult repair job. A job that involved working in a virtual lake, with muck and water up to 30 feet deep!

Under these conditions it would seem almost impossible not to fall behind the three-month schedule for completion . . . but "impossible" isn't in Gerke's vocabulary. And so, he pulled the job through, directly on schedule.

"But I couldn't have done it without the flawless performance of Cities Service lubricants," says the quiet man from Merrill. "Throughout the rugged months of work in muck and marsh, my equipment operated constantly without a single lubrication failure, thanks to Cities Service C-500 Motor Oil and Trojan Greases. When the chips are down, Cities Service comes through."

Mr. Gerke puts it in a nutshell. You can always count on Cities Service when the chips are down. But why wait until then? Why not start using Cities Service lubricants this week? A Cities Service Lubrication Engineer will gladly help you select the precise type for your equipment. Or, if you'd like more information, write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

"Gerke from Merrill" is the way Lawrence Gerke likes to be known. But he's better known for getting things done . . . and he uses Cities Service lubricants for the same purpose.

200,000 Yards of Borrow Dirt fill marsh where 100,000 yds. of muck were removed. Despite grueling work and tight schedule, Gerke finished on time . . . without a lubrication failure!

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

In diesel engine overhaul . . .

"Never any trouble with Clevite 77"

The Diesel Service Unit Company, Portland, Oregon, has specialized in engine rebuilding since 1945. During this time, overhaul work has been performed on every conceivable type of equipment powered by diesels.

An interview between Mr. Wally Yost, partner-owner of Diesel Service, and Mr. Dale Huff of The Cleveland Graphite Bronze Co., brings out some interesting observations on the performance of Clevite 77* engine bearings. We believe you will find highlights of this discussion impressive.

Mr. Wallace H. Yost,
Partner-Owner

Q Mr. Yost, will you briefly outline the type of service you perform?

A We are primarily diesel engine rebuilders. I would say we overhaul an average of 200 engines a year.

Q Does your business come from any specific region?

A Mainly Oregon and southwestern Washington. Approximately a 350 mile radius.

Q What operating conditions do diesels encounter in this area?

A From sea level to 7000′. Temperatures from 30 below to 110°.

Q What do you recommend as standard engine bearing maintenance practice?

A Once an engine is out of the frame, we recondition the shaft if the journals are out .001″ or more. If the engine is in the frame and the shaft is smooth, we prefer to limit the out of round and taper to .002″.

Q In order of preference, which brands of bearings do you use?

A We use only one brand . . . Clevite 77.

Q Why did you start using Clevite 77?

A As we were tearing down engines for overhaul or repair, Clevite 77 bearings were always in much better condition than other bearings. We noticed some engines with two different brands, and Clevite 77's were always in better shape. They looked like new compared to other bearings.

Q How long have you been using Clevite 77?

A Five Years.

Q In addition to what you said earlier, are there any other reasons why you've standardized on Clevite 77?

A Previously we pulled engines down to check bearings; now we pull them because of excessive blow-by, oil consumption or some trouble other than bearings. We never have trouble with Clevite 77.

You, too, will find the patented tri-metal construction of Clevite 77 provides greater fatigue strength, corrosion resistance and a superior running surface.

Where load and operating conditions require engine bearings with high-duty stamina, there's nothing better than Clevite 77*. See your nearby N.A.P.A. jobber for the *complete* Monmouth* bearing line.

Your NAPA Jobber is a Good Man to Know!

*The words Monmouth, Clevite and Micro are registered trade marks of Clevite Corporation

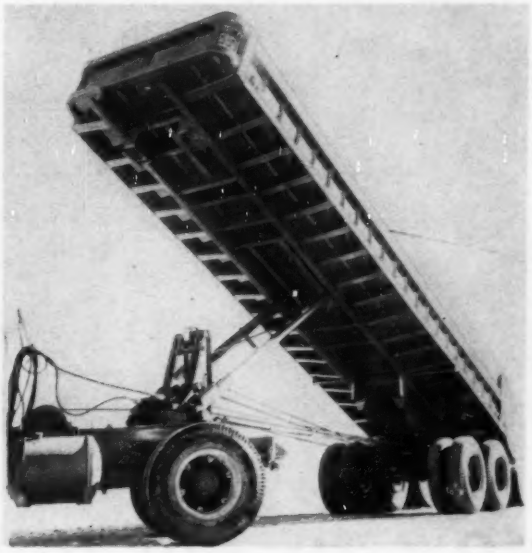
Monmouth
ENGINE BEARINGS

CLEVITE SERVICE

The Cleveland Graphite Bronze Co.
Division of Clevite Corporation
Cleveland 3, Ohio, U.S.A.

Tractor PTO Vibrates Roller

A new tractor-drawn roller featuring a vibrator powered by a hydraulic fluid motor instead of the usual gasoline engine has been introduced by Rolcor Industries. Called the Hydrapac, the roller attaches to any small wheel tractor and uses its rear-end power take-off. This simplifies the vibrating mechanism and reduces both the original cost and maintenance requirements. The unit is 5 ft wide and 2½ ft. in dia. It weighs 3206 lb.—**Rolcor Industries, 1108 Nicollet Ave., Minneapolis 3, Minn.**

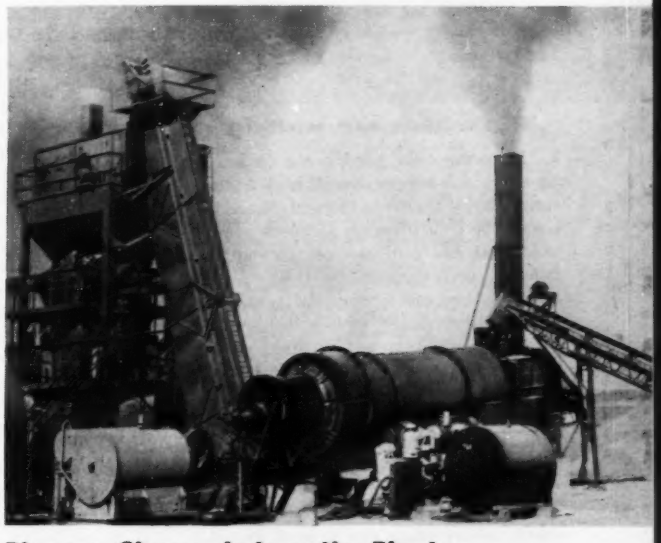


Dump Trailer Made Stronger

By integrating more closely the basic components of the Hobbs-Schonrock cable dump trailer, the manufacturer has come up with a much stronger unit without increasing its weight. Connections between all component parts have been strengthened and sub-frame and riser brackets have been redesigned to absorb shock loads better. The box, center beams, and main frame also have been beefed up. It is available with single or tandem axles.—**Hobbs Trailers, 609 N. Main, Fort Worth, Texas.**

Gardner-Denver Adds to Line

Gardner-Denver has extended its line with the addition of two concrete vibrators, both of which feature carburized steel casing tubes and stellite-covered tips to reduce wear. Powered by air motors, the 2½ and 3-in. vibrators both have a flexible rubber coupling between the motor and the rotor to reduce shock. Other features includes a built-in line oiler and double-row radial ball bearings at each end of the rotor.—**Gardner-Denver Co., Quincy, Ill.**



Pioneer Shows Automatic Plant

Pioneer's Auto-batch bituminous plant, now available after two years of field testing, features automatic controls that switch to semi-automatic or manual operation without modifying or disturbing the automatic system. The plant, rated at 6,000 to 7,500-lb per batch, has quick-acting gates that run the length of the pugmill so that a batch can be discharged in as little as 3 sec, according to the manufacturer. Two pre-determined mix formulas can be

How to cut job delays that rob scraper production

Moving dirt in the competitive situation today calls for a high degree of operating efficiency. A well-run scraper spread can load-out up to *twice* as much earth as an identical spread that is hampered by an accumulation of "minor" delays. There are many ways of correcting an unbalanced fleet to eliminate waiting time. To help you keep your scrapers and pushers moving at a uniform rate for highest production, here are some helpful suggestions.

One of the most serious lost-time problems is in waiting time of pushers or scrapers in the cut.

IF pushers are waiting

1. It seems only good sense to have on every job several small, high-speed scrapers in the 7 to 9-yard "handyman" class. With such scrapers available, you can pull one or more in to balance your production fleet whenever pushers are waiting for scrapers. When the balance swings the other way and scrapers are waiting, chase your small units out on odd-lot dirt-moving. They are money savers for small-yardage cuts where they can profitably self-load, such as: light production cuts; removing and stockpiling topsoil; building access roads, detours, drainage; or for haul-road improvement, where they can spread gravel, fill muddy low spots, etc.

2. Check to see if you can shorten the haul by concentrating dumping on the near-end of the fill.

3. Study haul and return. Are your operators "dogging"... is haul-road smooth, properly drained, properly surfaced for fast travel? Operators automatically slow down on rough roads to protect their machines and their own bottoms. Would it help to get your graders in to improve haul-road and get more speed? If there is a one-way stretch where scrapers are delayed, maybe you need to two-lane it or build a midway pass-around?

4. When pushers are waiting, it's a good time to put an extra yard or two on each load with a longer push cycle. Also, if you have modern high-speed pushers, be sure they push through to give the prime-mover a running start into hauling-gear.

5. Couple your pusher to a ripper and plow-up cut for easier loading, by changing your push-back-push cycle to an oval with end turn-arounds. This productively utilizes your pusher waiting-time, speeds up loading cycles, gets you bigger payloads.

6. If pusher is equipped with dozer blade, use wait time to clear boulders, stumps and roots from cut areas. This will speed loading cycles later on.

7. Use pusher waiting time to improve cut and haul-road drainage (especially if you have modern, high-speed, dozer-blade equipped pushers that can handle hit-and-run jobs).

8. If your unbalance is caused by a scraper being down for repairs or service, check your preventive maintenance program and try harder for elimination of work interruptions.

9. If your scrapers are getting slow cycles due to wet footing, improve drainage with your grader, and remember next time to provide good working drainage for the cuts ahead *before the rains come.* Also remember to incorporate side drainage in cuts and fills by keeping drainage areas at the side low, and by leaving a crowned center area until you get to finished grade stage.

IF scrapers are waiting

1. Load a little on the light side, don't take the extra seconds it takes to get that last yard up on the heap. Don't let pusher take time to boost the scraper-unit up to hauling-gear speed after completing load.

2. Dump your scrapers at the far end of the dump area. Possibly you can shift one or two scrapers for an extra long haul operation.

3. Have scrapers partially self-load with a light cut as they make their incoming pass through the cut area.

4. Step-load your machines in long cut areas to save pusher time.

5. Pull in an extra pusher if you have any high-speed, rubber-tired tractors available. Even a heavy-duty

(Advertisement)

grader in the 150 to 190 hp class can do an acceptable push-loading job on the modern, 18-yard scrapers with easy-loading Fullpak® scrapers. Incidentally, your graders should be equipped with utility dozer blades. These improved big graders can move in at speeds to 27 mph.

6. Consider purchase of one or more high-speed dozer-pusher units for utility traveling-man service over your entire work-area. With speeds of around 17 mph, one of these units can easily be pulled in from pioneering, finishing, or utility work to step-up production of your scraper fleet whenever needed.

General suggestions on unbalance

1. Operators, being human, tend to bunch-up in the borrow pit. Try to speed-up the laggards and slow down the hot-rod drivers. An across-the-fleet bonus for increasing pay-yard production can be a very sound investment. But make your "pay-off" on teamwork basis . . . not on individual competition.

2. Scheduling a swing-shift crew for servicing and refueling of your equipment can give you an added ½ hour of production for each scraper during the course of the day. A service truck can easily handle urgent calls for fuel, grease or field adjustments during the lunch time break.

3. A bonus to operators for no down-time on a week or monthly basis can pay-off if accompanied by an educational program on preventive maintenance.

4. If you have a temporarily unbalanced fleet involving waiting line-up of scrapers, get your scraper operators to slow down a bit on haul and return. Sure, it's only natural for them to high-ball and get a five for a smoke and a chat as they sit and wait. But the high-balling costs you fuel, tire wear and higher maintenance. If it results in extra pay-yards for profit, that's swell. But, if it just gives the boys a chance to sit with idling engines, slow them down with an "easy does it".

5. Ripping and scarifying hard loading material pays off in faster loading. On some jobs, it is possible to reduce loading time from 3 minutes to ½ minute by loosening the soil. Clearing boulders and stumps from cut areas will help speed loading and also reduce equipment delays needed for repairs.

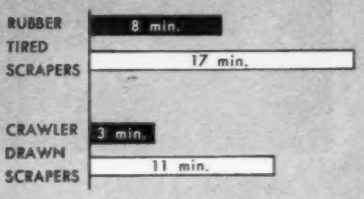
6. Travel speed throughout the cycle is a major factor affecting scraper output. Spongy, slippery, rock-strewn, or just rough and rutted haul-roads can cut your scraper's speed in half. Haul-roads properly graded and drained by modern motor graders permit maximum speeds, increase safety, and reduce costly equipment repairs.

Want to talk it over with your foreman?

If you do, we'll gladly send you reprints of this advertisement without charge. Just tell us how many copies you want. There is also a valuable 60-page booklet prepared by our field engineers called "Earthmoving — An Art and a Science". Ask for that too, if you need extra copies. Write . . .

Minutes you can save per hour by increasing job efficiency

Chart* shows number of minutes per hour that can be saved by correcting delays. Because of their slower speeds, crawlers cannot capitalize on savings like rubber-tired equipment.



* Source: Bureau of Public Roads.

Ripping and scarifying hard loading material pays off in faster loading. On some jobs, it is possible to reduce loading time from 3 minutes to ½ minute by loosening the soil. Clearing boulders, stumps, and roots from cut areas will often help speed loading and also reduce need for equipment delays for repairs.

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LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

2 sure ways to reduce COMPACTION COSTS

THE BARCO RAMMER

Put Barco Rammers on the job and watch the results. One of the biggest advantages they offer is ability to handle work in minimum time.

HIGH DEGREE COMPACTION — In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method) — EASILY . . . EFFICIENTLY . . . ECONOMICALLY!

FOR TOUGH JOBS — The Barco Rammer is especially useful for compacting fill in restricted areas close to walls, culverts, and abutments—in trenches, ditches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

ONE MAN OPERATION — On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. *Ask for Catalog 621.*

THE BARCO VIBRA-TAMP

The new Barco VIBRA-TAMP is a proven tool—superior in design and performance — backed by leading equipment distributors representing Barco in all parts of the country.

VERSATILE PERFORMANCE — For vibratory compaction of granular base materials and tamping bituminous surfacing.

ECONOMICAL—to buy, operate, and maintain! No special tools required. Saves your bigger, costlier equipment. Tamp up to 750 sq. yds. per hour. A real work-horse on sand, gravel, soil, chippings!

EFFICIENT, DEPENDABLE—One man does the work of many with VIBRA-TAMP. Self-propelled. Operates in any weather. Works flush against curbs, foundations, and walls. Simple design and quality construction keep the machine on the job day in and day out. Moving parts fully enclosed. Handle adjustable to comfortable height. *Catalog 630.*

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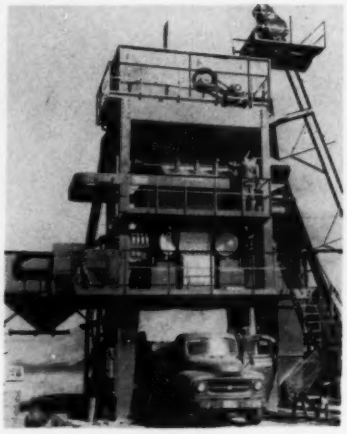
BARCO
PRODUCTS BACKED BY EXPERIENCE

BARCO MANUFACTURING CO.

512C Hough St.
Barrington, Illinois

EQUIPMENT NEWS . . .
continued from page 187



set up at one time and the plant can be switched from one mix to another. To increase mobility and to cut down on moving costs, the plant features a combined drier-dust collector mounted on a single frame. The tower unit also is built as a unit with each section—screening, weighing, and mixing—fully integrated for easy erection or disassembly. Sections can be loaded on a low-boy or they can be equipped with transportation wheels and axles. The combined drier-dust collector unit utilizes a drum that is 90 in. in dia, 24 ft long, and ⅜ in. thick. It incorporates a trunnion roller friction drive instead of the more troublesome chain or pinion-and-ring-gear drive. A unique closure hood over the drum admits air to cool and discharge where the flame is the hottest, and to provide auxiliary air for better combustion. Any standard burner can be hooked into the drier, which can be equipped with an automatic modulating temperature control system. The plant also has a 5x12-ft vibrating screen running at 1,150 rpm. It is located over a four-compartment hot bin with a capacity of 30 tons (6,6,6, and 12-ton compartments). Other components include an 85-cu-ft aggregate weigh hopper and a 1,000-lb asphalt bucket that are suspended on Howe scales with 5 and 1-lb increments, respectively; a continuous circulating bitumen system and pugmill jacketed for either steam or hot oil; a vertical mineral filler system rated at 60 yph; and a built-in sampling device. The plant is designed to operate from electric motors, and all on-plant wiring is done at the

RAIN

Near Massacre Rock — scene of immigrant wagon-train tragedy in 1862 — C Rear-Dump spills heavy 11-yard rock load on the fill. Hauler has positive "up", positive "down" dumping action . . . cleanly dumps load well behind wheels . . . minimizes clean-up on banks, at grizzly, etc.

didn't stop this job at Massacre Rock!

How often does an hour or so of rain stop your haulers . . . halt earthmoving while costs continue until end of the day? When you're operating several units, just a few non-productive hours "now and then" can soon add-up to the difference between profit and loss on your contract.

Work thru rain and muck

Duff Reed Construction Co., Twin Falls, Idaho, used Elle Construction Co.'s two 22-ton C Tournapull® Rear-Dumps on a grading job near Massacre Rock. Loaded by a 2½-yd. shovel, big haulers moved 80,000 yards of rock over dirt roads on rebuilding 8.2 miles of U.S. 30N, west of American Falls, in southeastern Idaho.

Rain fell during the afternoon, as Rear-Dumps hauled fill for the new roadbed . . . cleaning-up a rock cut 380′ long, 68′ wide, and 22′ deep. The dirt haul road became slick, and got progressively worse as the rain increased. Yet, C Rear-Dumps kept rolling steadily, hauling heavy 11-yd. payloads. Tournapull haulers covered the 2700′ route — load, haul, dump, and return — in an average of 7.3 minutes. In spite of rain, dumpers worked straight thru until 4:30 quitting time.

Good mudders

LeTourneau-Westinghouse Rear-Dumps are specially engineered to work steadily in mud, sand, soft fills and other slippery or unstable footing. Exclusive Tournapull power-transfer differential always keeps most pull-power on drive-wheel with best traction . . . maintains essential momentum and power . . . keeps loaded unit rolling where other haulers can't go. Big, low-pressure tires get firm "grip", spread weight for heavy pulling without sinking-in. And with geared electric power-steer on kingpin, prime-mover can be swung alternately 90° left and right, to "walk" load out of bog-down footing.

"In and away from shovel, fast"

Says Tex Henry, Superintendent for Elle Construction Co., "These Tournapulls get in and away from the shovel so fast, that there's no comparing them with other rigs. Their high haul speed and fast maneuverability make them ideal for us. We're also getting two 18-yd. scrapers to interchange with Rear-Dumps on these prime-movers."

To reduce per-hour ownership costs, and increase profit, your same "C" prime-mover can operate: bottom-dump, side-dump, scraper, lift-and-carry crane, or flatbed. Each added trail-unit costs only about 25% of the original investment . . . changeover takes only a few hours. Optional trail units also available for 35-ton "B" and 11-ton "D" sizes. Call or write us.

Elle Construction Co.'s 22-ton C Tournapull Rear-Dumps haul steadily from rock cut . . . thru afternoon rain that made dirt haul roads soft and slippery . . . on 8.2-mile Duff Reed Construction Co. project, near American Falls, Idaho.

CR-1565-DCJ-1

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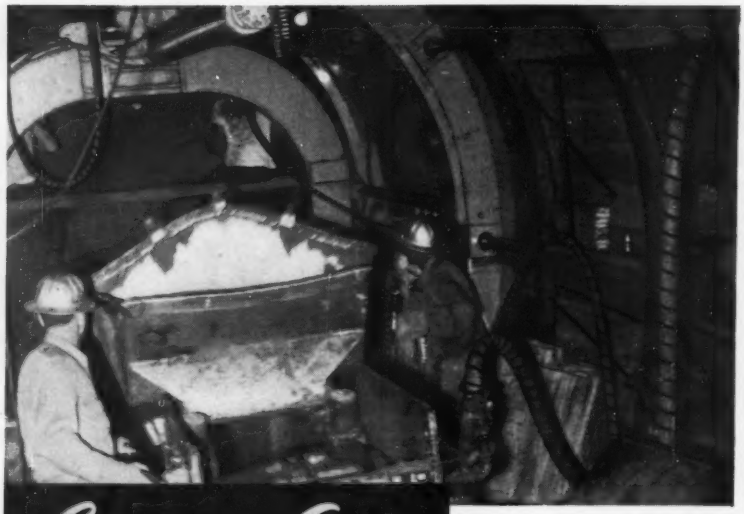

Stands Out ON ANY JOB!

WIRE BRAID

"HARDROK" Air Hose

There are two good reasons why "HARDROK" *stand out* wherever it is used... its black-striped yellow cover and its unequalled performance in the toughest applications... drills, jumbos and other air equipment.

Carcass is made of horizontally braided steel wires, providing exceptional strength, durability and resistance to kinking without impairing flexibility. Tube is long-lasting synplastic®, impervious to action of oil. Cover is tough, wear-resistant rubber... yellow with black spiral stripe to identify the hose that means *longer service life, lower replacement costs.* Sizes ½" to 3", inclusive.

"If it's GOODALL, it MUST be GOOD!"

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HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

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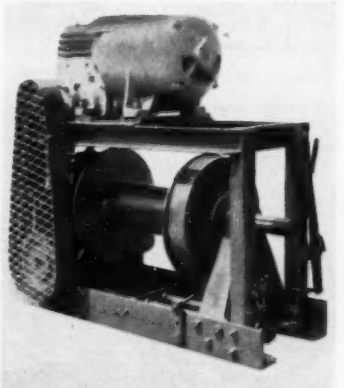
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES. IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

factory. Total weight of the tower unit, including the hot elevator, is approximately 88,000 lb. The drier-dust collector, including a covered conveyor for returning fines, weighs approximately 70,000 lb. — **Pioneer Engineering, Div. of Poor & Co., Minneapolis 14, Minn.**

NEW DUMP TRAILERS—A new line of dump trailers has been introduced by the recently formed Loadmaster Co. of Shreveport, La. The line features a new hydraulic cam-action lift system that permits extremely high dumping angles when handling sticky clays or other hard-to-dump materials. The maximum dump angle is 80 deg on some models and 60 deg on larger bodies. Production models will be offered in capacities ranging from 10 to 30 yd with beds from 16 to 28 ft in length. Single and tandem-axle models are available.— **Loadmaster Co., P.O. Box 4263, Shreveport, La.**



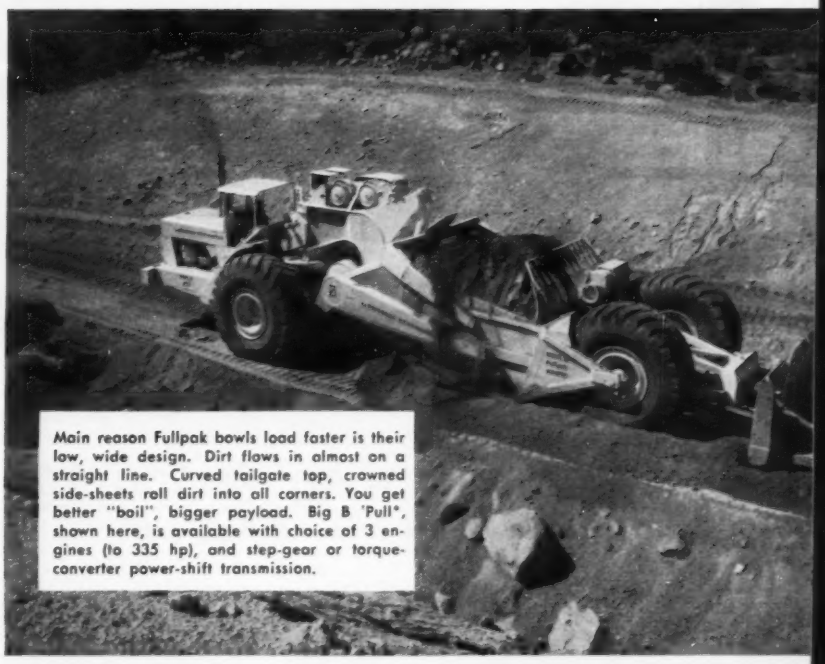
ELECTRIC WINCHES — A new line of electrically operated winches for use with cranes, derricks, material elevators, draglines, and other construction equipment have been introduced by Sasgen Derrick Co. Four models are available with electric motors rated at from 1½ to 35 hp. Line speeds range from 10 fpm

(Advertisement)

Electric controls speed work-motion of Tournapulls. 210 hp, 18-yd. "C", shown, is controlled by fingertip switches on dashboard. Simple, weatherproof motors give split-second response in powering apron-lift, tailgate motion, bowl-hoist, and steer. World-wide use over many years proves electric controls easiest to use and to maintain, fastest acting.

When is the best time to replace an earthmover?

There's a new standard, in earthmoving, for deciding when a machine needs replacement. Years ago, you remember, you were guided mainly by maintenance cost. If repair bills on any rig got out of hand, out it went. But that was when jobs where smaller, profit margins bigger: when *production* wasn't so all-important. Today, smart operators judge the obsolescence of a machine not so much by what it costs to *maintain*, but by what it can or cannot do in the way of *production*.



Main reason Fullpak bowls load faster is their low, wide design. Dirt flows in almost on a straight line. Curved tailgate top, crowned side-sheets roll dirt into all corners. You get better "boil", bigger payload. Big B 'Pull*, shown here, is available with choice of 3 engines (to 335 hp), and step-gear or torque-converter power-shift transmission.

A loser . . . yet still in "good shape"

That's why, nowadays, a scraper can be a liability and ripe for replacement even though it still functions smoothly. Cost-conscious contractors realize that no matter *how* maintenance-free a scraper, if it's not moving maximum yardage, at *lowest-net-cost-per-yard*, it's just too expensive.

Consider, for instance, an imaginary project in which a scraper is completing a load-haul-and-spread cycle in 5.55 minutes . . . for 9 cycles every 50-minute hour. Assume, too, that it averages 11 pay-yards each trip. You're moving 99 yards an hour with that scraper . . . and if you've bid your job right, you're probably making money.

Compare with bigger, speedier unit

Now, however, look at what a scraper that loads, hauls, and spreads *faster* . . . and that has a bigger payload capacity . . . can do. If it knocks off just a half minute per cycle, it will complete 9.9 cycles an hour. And if it also packs in just 2 more yards per load, you're moving not 99 yards an hour, but 128.7. At the national average rate of about 40¢ a yard, you'd be earning $11.88 more per scraper per hour!

Project those figures, and each of your faster, bigger scrapers would be earning for you $118 more every 10-hour day . . . $649 more every 5½-day week. In other words, the smaller, slower, old-fashioned scraper is *costing* you $649 a week to keep on the line! Not in maintenance costs . . . not in ownership or operating costs . . . but in reduced income *potential*.

That's the kind of scraper that needs replacing — no matter *what* shape it's in.

Move more yards faster . . .

That's why fast-traveling Tournapulls®, with easy-loading *big*-capacity Fullpak® scrapers, are replacing so many earthmoving tools . . . both old and new . . . around the nation. Tournapulls will *not*, of course, move 128.7 yds. an hour on every job, in every condition — the figures quoted above are based on a hypothetical situation — but what they *will* do, on every job, is to move *more* yards *faster* . . . at the *lowest-net-cost-per-yard*.

Ask for full details, and a demonstration of Tournapull . . . available in 9, 18, and 27-yd. heaped capacities.

"Handyman" scraper of Tournapull line is 138 hp, 9-yd. "D". Like all 'Pulls, it has exclusive power-transfer differential, to keep you working in mud and slippery conditions. When one wheel starts to slip, this differential transfers torque-power to wheel on solid footing, keeps you moving. With 90° kingpin steer, you can "duck walk" out of trouble, too . . . turning prime-mover side to side until you're on good footing again. *Trademark P-1732-DC-1

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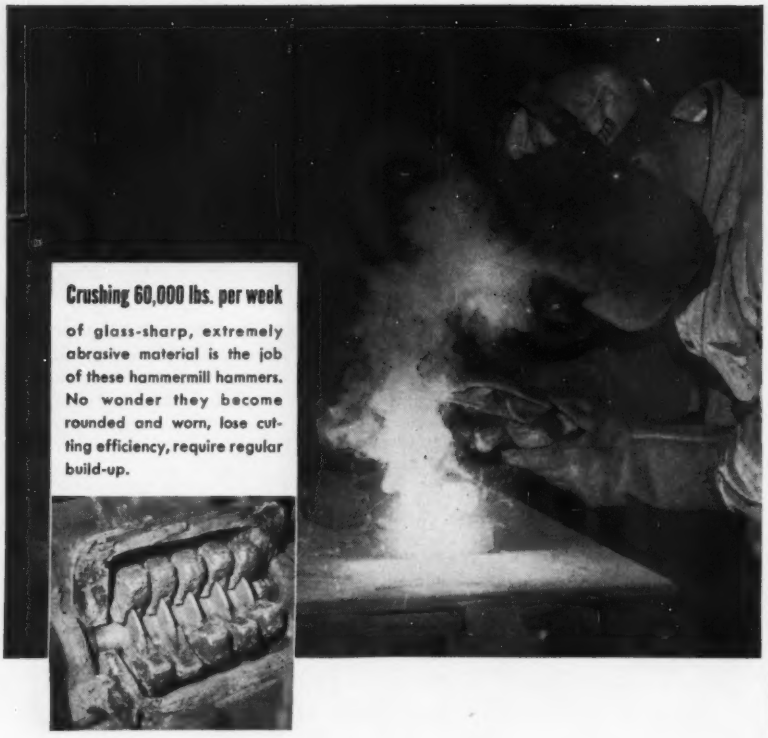

Crushing 60,000 lbs. per week
of glass-sharp, extremely abrasive material is the job of these hammermill hammers. No wonder they become rounded and worn, lose cutting efficiency, require regular build-up.

HARDFACING WITH AMSCO 20

doubles service life . . . cuts electrode costs

Welding Flux Processing, Chicago Heights, Illinois, know a good thing when they see one. That's why they've switched *exclusively* to Amsco 20 electrodes for hardfacing of these hammers. They're saving three ways:

1. Service life of the built-up hammers and the mill housing itself has been doubled, because of Amsco 20's high abrasion resistance.
2. Amsco 20 electrodes cost about 40% less than the type previously used.
3. Welding speed is stepped up. Amsco 20, an iron powder "contact" electrode, is easy to handle and gives a high deposition rate.

In this and many other severely abrasive applications, Amsco 20 has *proved* its ability to provide superior wear resistance at low cost. Available from stock in 3/16" diameter, to handle hardfacing jobs of almost any size.

Call your nearby Amsco Welding Distributor now, for a demonstration of Amsco 20. Or write direct for technical data to: Amsco Welding Department, Chicago Heights, Illinois.

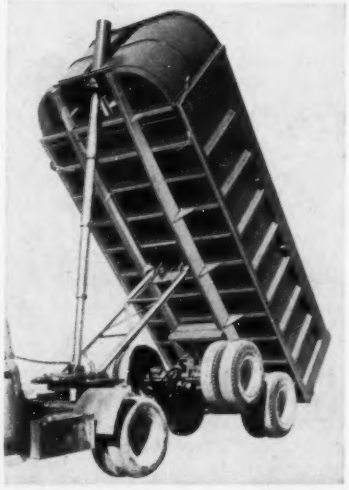
AMERICAN Brake Shoe COMPANY

AMSCO®

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

with a 2,200-lb load up to 35 fpm with a 22,000-lb load. Cable capacities range from 320 to 885 ft, depending upon the size of the line. The ruggedly built winches feature heat-treated, ground and polished cable drum shafts. Light and medium-duty models have a bronze alloy worm gear and in heavy duty models the worm gear is an integral casting with a steel center and bronze alloy rim. Winches rated over 6,000 lb capacity have an automatic oil-cooled adjustable worm safety brake, and 5000 and 6000-lb winches also have automatic, adjustable bank-type brakes. A sliding, shrouded jaw-tooth clutch is standard on all models.—**Sasgen Derrick Co., Dept CML, 3101 W. Grand Ave., Chicago 22, Ill.**



REDUCES WEIGHT—A 27-yd frameless dump trailer is the latest addition to the line of dump bodies produced by Marion Metal Products Co. Called the FDT-270, the trailer is a 24-ft tandem-axle body that is raised with a Marion front-end telescopic hoist. The trailer will also be available with a single axle. The hydraulically-raised body has two arms that connect to the upper fifth wheel of the tractor and the underside of the trailer body. The front-end hoist provides the lifting power. From the cab, the driver can raise the load, hold the body stationary, dump, and lower the body. For spotting the load, the operator locks the trailer brakes and telescopes the hoist. This pulls the tractor backward as the body is raised and the load

(Advertisement)

Why you need grader GO-*power*

Adams* 8-speed constant-mesh transmission gives you more full-power speeds for grading, maneuvering, traveling

It's just common sense: The faster your grader works... the more jobs it completes... the lower your grading costs. That's why LeTourneau-Westinghouse equips every 80 to 150 hp Adams grader with a transmission that gives you 8 forward speeds, 4 reverse, plus 3 (optional) creeper speeds. You get the extra GO-*power* of 15 full-power speeds... so your operator can apply maximum grader power on almost every work, maneuver, or travel operation. Here's how it pays off:

Up to 28% extra blade-work

For the ordinary run of grading jobs, these heavy-duty Adams graders have 4 efficient work speeds... compared to only 3 on most other graders. With more speeds at which maximum engine horsepower can be used, Adams machines move more dirt... produce more work in a day's time.

For example — on average grading work, a 115 hp Adams 440 works in third gear (4.6 mph). Other graders of similar size, not having this extra power-speed combination, have to shift down to 3.6 to 4.0 mph. That's because their third gear is much too fast, and less powerful. On such a job, the Adams does up to 28% more work. It will give you similar extra output on almost any task you can name.

Adams 2 intermediate speeds — around 10 and 14 mph — give added speed for maneuvering, and climbing tough grades. Practical travel speeds to 25 mph move these high-production graders quickly from job-to-job.

Bonus output on one-way work

Most graders have only 2 reverse gears, to 7 mph. Adams 80 to 150 hp machines have 4... 2 for blading, 2 for fast back-up. Again, you get more blade-work done with more speeds. Often your operator works a section where it's impractical or impossible to make turn-arounds... so he backs-up.

Adams higher reverse travel speeds (8 to 13 mph) get grader back to its starting point fast... convert otherwise wasted reverse travel time to bonus blade-work. On average shuttle-grading jobs, where graders may work at similar speed, an Adams with 13 mph reverse, makes 5 blading cycles in the time it takes other machines (top reverse about 7.0 mph) to make 4.

Faster completion with extra power... precise control

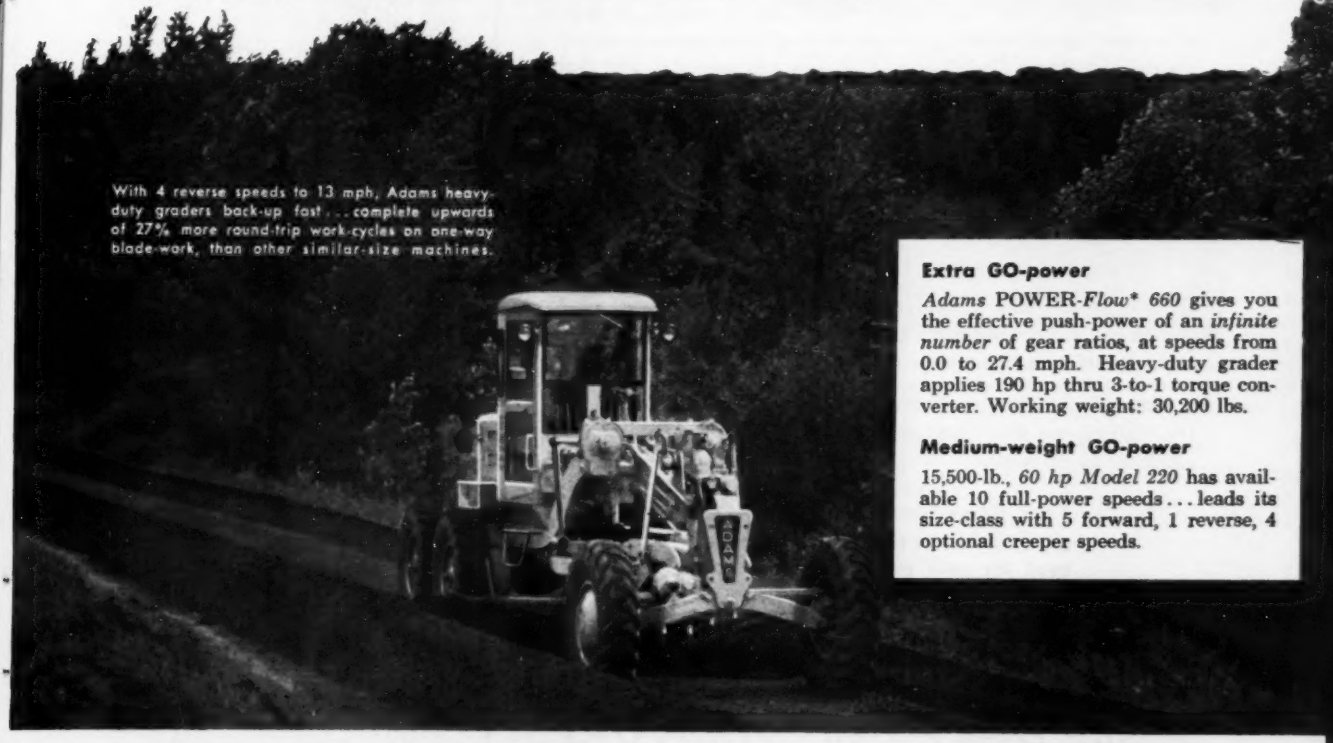
Adams optional creeper gears provide 3 full-power operating speeds *as low as 35' per min.* These low-low speeds give you work-power to take a big cut while blading slowly... concentrate full engine horsepower for scarifying old roadways and blading thru rocks, roots, etc.... help you prepare precise finish grades... save time when working and maneuvering in close quarters.

Added work-power is FREE

Adams graders cost no more than other graders of similar size and power. Whether you need 80, 115, 123, or 150 hp, you get the extra work-power of Adams 12 standard speeds — in constant-mesh transmission — *without extra charge.* Creeper gears are optional, at nominal cost.

Call or write for details, and a demonstration of GO-*power* in action.

*Trademark G-1460-G-1



With 4 reverse speeds to 13 mph, Adams heavy-duty graders back-up fast... complete upwards of 27% more round-trip work-cycles on one-way blade-work, than other similar-size machines.

Extra GO-power

Adams POWER-*Flow** *660* gives you the effective push-power of an *infinite number* of gear ratios, at speeds from 0.0 to 27.4 mph. Heavy-duty grader applies 190 hp thru 3-to-1 torque converter. Working weight: 30,200 lbs.

Medium-weight GO-power

15,500-lb., *60 hp Model 220* has available 10 full-power speeds... leads its size-class with 5 forward, 1 reverse, 4 optional creeper speeds.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Where quality is a habit

DRY IT OUT WITH ROME DISK PLOWING HARROWS!

Heavy rain last night — mud this morning? A few hours cutting and aerating the site or haul road with a crawler tractor and Rome Disk Plowing Harrow can save the day! On the cut a Rome loosens and dries material to full scraper-blade depth, facilitating loading. On the haul road, it fills in ruts, helps dry out the slick surface. The Rome Disk Plowing Harrow can be hitched or unhitched from the tractor drawbar in *seconds*, immediately releasing the tractor for other work.

Rome Disk Plowing Harrows are ideal contractors' machinery for blending in-place materials or soils, for stablizing road shoulders, dam fills or bridge sites. These multi-purpose machines can reduce your equipment investment, cut operating costs, speed up production.

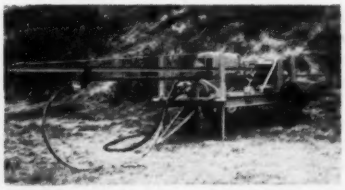
Rome Disk Plowing Harrows can speed up land clearing, too, cutting out brush and springy young trees too flexible for efficient 'dozer work.

Your Rome-Caterpillar Dealer will gladly help you select the machine you need for your project. See him soon!

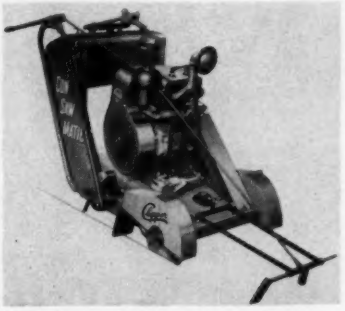
ROME PLOW COMPANY, Cedartown, Georgia

Rome Disk Plowing Harrows

is deposited at a given spot. Stabilizer pads mounted on the tandem axle assembly provide maximum stability as the body reaches its top dumping angle. All moving parts of the trailer are visible for inspection and servicing. According to the manufacturer, the trailer can be mounted on any standard tractor in 3 hr.—**Marion Metal Products Co., Marion, Ohio.**



HORIZONTAL DRILL — Newest addition to the line of rotary drilling rigs manufactured by the George E. Failing Co. is a horizontal weep-hole drill with a capacity for drilling 4¼-in. horizontal holes to a distance of 300 ft. The trailer-mounted unit is designed to relieve the causes of earth slides along highways or railroads due to excessive moisture. Perforated casing is inserted in the horizontal holes so that continuous draining of the affected area is obtained.—**George E. Failing Co., Enid, Okla.**

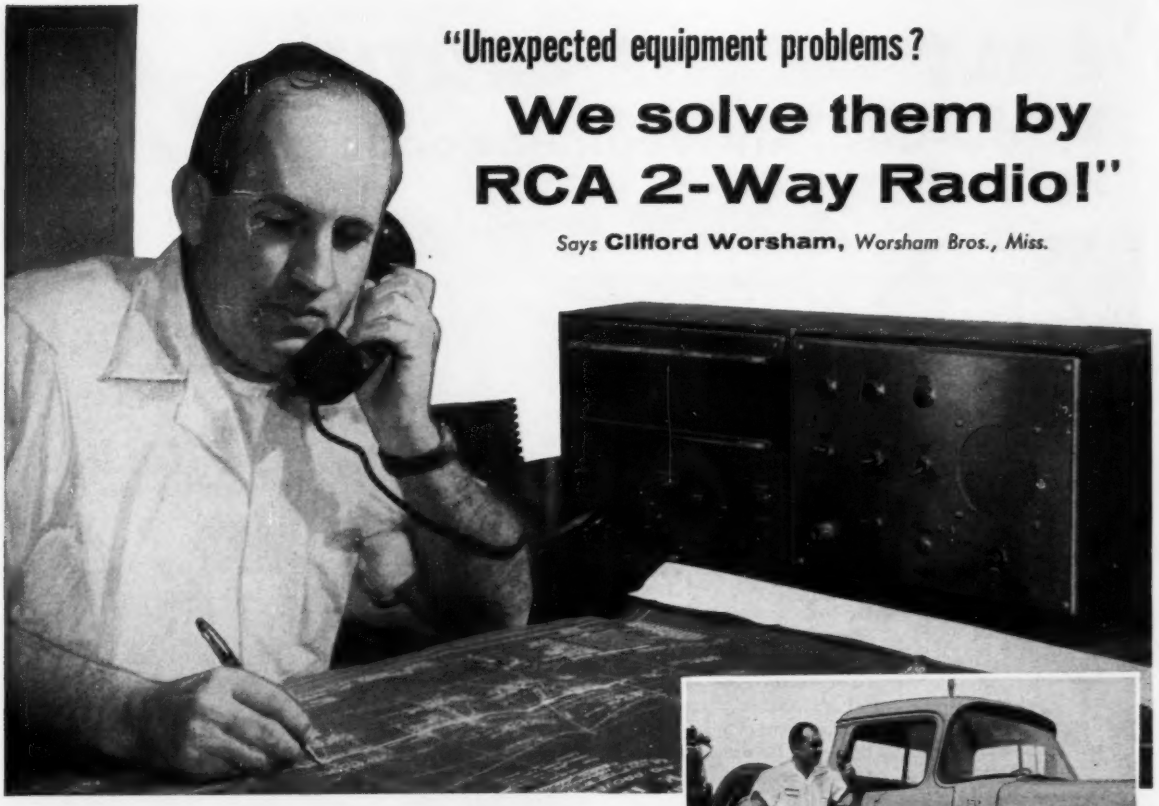


MORE POWER—The Clipper model C-180 concrete saw, which replaces the model C-146 in the company line, features a 23% increase in power and a bigger transmission. The C-180 has a 18-hp Wisconsin engine. According to Champion, the increased horsepower means faster sawing, longer blade and engine life, with no sacrifice in maneuverability. The C-180 also features a clutch-type water pump that eliminates the need for disconnecting the water pump belt when running the saw

"Unexpected equipment problems?

We solve them by RCA 2-Way Radio!"

Says **Clifford Worsham,** *Worsham Bros., Miss.*



Clifford Worsham, one of the three Worsham brothers who started the big highway construction business in Corinth, Miss., in 1945, finds their RCA 2-Way Radio system a great help in handling unexpected equipment problems. Here he checks a blueprint while talking over heavy equipment requirements with a project superintendent who is two hours away by highway travel. Another brother, Frank Worsham, writes: "The system is definitely saving us money. It's wonderful for eliminating delays in getting heavy road building equipment from one job to another, expediting trouble-shooting, speeding help in emergencies. We chose RCA 2-Way Radio because we know the RCA reputation for quality."

Worsham Bros.' highway construction operations are far-flung with as many as a half-dozen projects going at the same time. The RCA Carfone "Fifty" System includes 12 mobile units installed on one low-boy trailer, two cars, eight pick-up trucks and one heavy truck. Thanks to RCA 2-Way Radio, all of the activities now are at the fingertips and ears of managing personnel in the Corinth, Miss. Office and Maintenance Shop.

Shop mechanic with pick-up truck stays close to office and project, ready to handle any emergency by means of 2-Way Radio.

Job superintendent confers on progress, checking with another brother, Leroy Worsham, many miles away.

Mail coupon for information

RCA

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☐ Please send me FREE literature on the use of RCA 2-Way Radio in the construction business.

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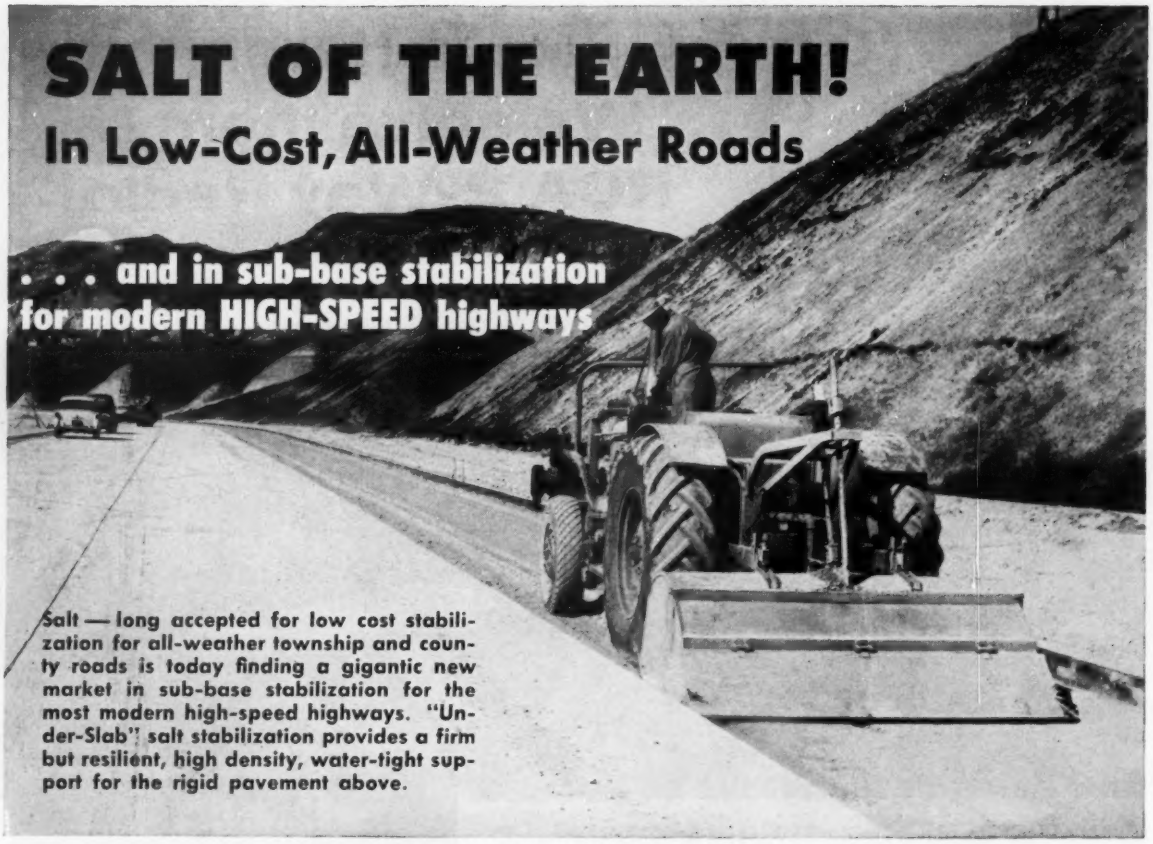
☐ Have RCA Communications Specialist make a FREE RADIO SURVEY of our business.

SALT OF THE EARTH!

In Low-Cost, All-Weather Roads

. . . and in sub-base stabilization for modern HIGH-SPEED highways



Salt — long accepted for low cost stabilization for all-weather township and county roads is today finding a gigantic new market in sub-base stabilization for the most modern high-speed highways. "Under-Slab" salt stabilization provides a firm but resilient, high density, water-tight support for the rigid pavement above.

The Mixing Method — The Pulvi-Mixer

Virtually no other method today is employed for high quality mixing in salt-stabilized farm-to-market native soil or gravel roads. The Seaman-Andwall Pulvi-Mixer provides the greatest advantages in low cost sub-base stabilization:

1. The Pulvi-Mixer mixes and blends the salt to complete depth and at the same time blends coarse aggregates and fines so that — after compaction the mix is closely knit, voids are well filled and aggregates securely interlocked.
2. Usually the Seaman-Andwall mixing process costs about a cent a square yard — often less; little enough to build a durable, low-maintenance all-weather road — and certainly little enough to protect the huge investment involved in major highway construction. The cost is far less, production is greater and uniformity higher than with the old fashioned multiple pass operations with a blade.

Spreading

The most efficient spreading equipment for the original salt application is found to be either the Century HY-4 or the Century HY-8. Both are tailgate spreaders, operate hydraulically with only one man (the truck driver) and both meter salt with high accuracy.

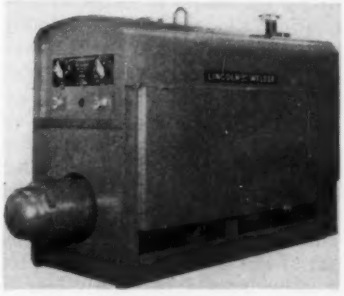
Recommended for compaction immediately after the Pulvi-Mixer operation is the highly maneuverable Seaman-Andwall 7 to 20 ton Pneumatic Compactor. Compressive forces are "straight down" so the Seaman-Andwall Compactor prevents displacement of materials, scuffing, shearing or raveling of the surface.

Studies of salt stabilization costs show that this type of construction runs as low as $400.00 per mile.

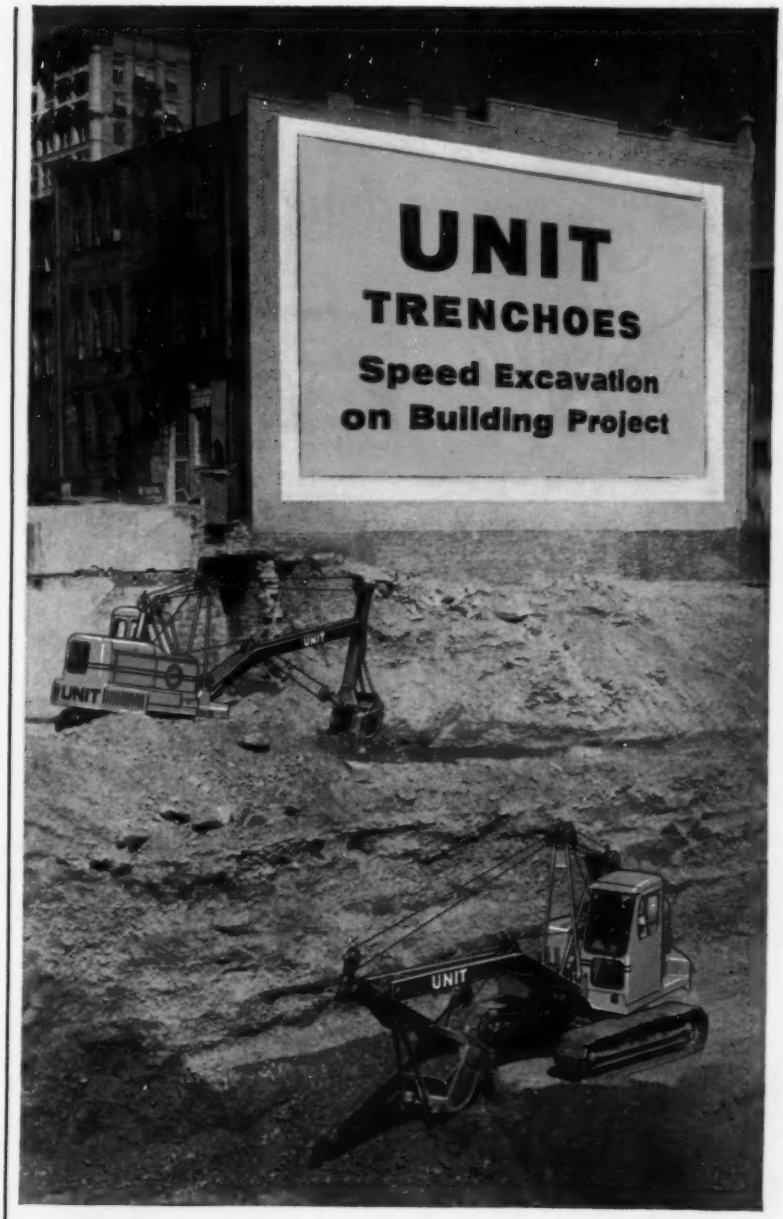
If you would like to have a Bulletin on Salt Stabilization, send a post-card to Seaman-Andwall Corporation — Dept. R-210 — Milwaukee, Wisconsin. We will get complete information and literature to you promptly.

SEAMAN-ANDWALL CORPORATION, Milwaukee 1, Wis., U. S. A.

dry or when idling the engine for extended periods. The pump also has by-pass piping that reduces the volume of water needed. The saw incorporates a three-point blade suspension system which, together with four wheels and pivoting front axle, keeps the blade straight in the cut. A patented positive screw feed system raises and lowers the blade smoothly. When sawing with abrasive blades, the operator can instantly compensate for diminishing blade diameters. Despite the horsepower increase, the C-180 sells for the same price as its predecessor. — **Clipper Mfg. Co., Suite 143, 2800 Warwick, Kansas City 8, Mo.**



SELF-CONTAINED WELDER— A new model of its widely used 6090 gasoline-engine driven portable arc welder has been developed by Lincoln. The new welder, called the K-6090 is rated at 200 amp at 40 v and 60% duty cycle. It features dual controls for the generator output, an electrical outlet that provides 1 kw of auxiliary dc power, and an idling device. The unit is powered by a Continental F-162 gasoline engine that develops 36 hp at 1,450 rpm. Controls of the new welder include a five-step selective current control and a continuous voltage control that provides fine adjustments in the current. The range of steps on the selective current control overlap so that it is possible to obtain either a high or a low open circuit voltage for any current. A tamper-proof engine idling device, used previously only on larger Lincoln welders, reduces engine speed to 1,000 rpm when the welder is not in use. When the arc is struck, it immediately accelerates the engine to its normal 1,450-rpm operational speed. Included with the unit as standard equipment are a 16-gal



• UNIT equipment was chosen by the contractor for digging this 25,000 yard excavation for a new Federal Reserve Bank Building in the heart of Salt Lake City. Quality, simplicity of design, economical operation and low maintenance costs are among the many reasons why contractors prefer UNIT.

UNIT Excavators are available in ½ to ¾ yard sizes . . . Cranes up to 35 tons. Crawler, Truck or Mobile . . . Gas or Diesel. Write for literature.

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Once Again Earnest is first to present Black Diamond
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nuts, safest, surest way to lock track pads on all CATERPILLAR TRACK ASSEMBLIES!
Be safe... be sure, with PAD-LOK nuts. High Carbon steel, double heat-treated, PAD-LOK nuts can be used over and over again. Unaffected by heat or cold. Send for prices and literature.
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And, don't forget GROUSER STEEL. Earnest cuts it to any length you require. Genuine Black Diamond Grouser Steel is your insurance against DOWN-TIME!
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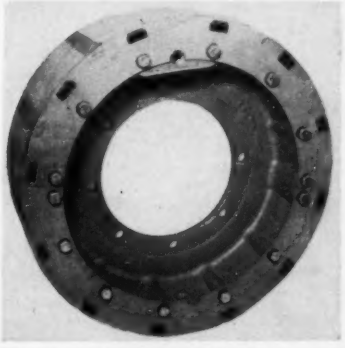
fuel tank that will operate the unit for 14 hr, an oil bath air filter, a complete housing including side doors, and a cold-weather carburetor de-icer. A battery-magneto starter is available as optional equipment. — **Lincoln Electric Co., Cleveland 17, Ohio.**

LOW-COST ASPHALT — The Cutler Unipaver No. 40 is a low-cost, ground-level asphalt plant that produces up to 40 tph of top-quality asphalt. A completely self-contained plant, the Unipaver consists of an aggregate feeder and proportioning unit, a double-drum dryer and mixer, and an asphalt storage tank with a built-in, automatic heater. The three aggregate bins have a combined capacity of 45 tons, and the asphalt storage tank carries 5,000 gal of heated asphalt. The Cutler double-drum dryer and mixer is said to employ a new method of drying aggregate and then mixing it with asphalt at unusually low fuel costs. The Unipaver, which is operated by one man, can be used both as a continuous mix plant or as a batch plant. In addition to producing regular paving asphalts, it can also produce mixes using cutbacks and emulsions. The plant is designed in unit sections that can be moved easily.— **Cutler Engineering Co., 5435 W. 63rd St., Chicago 38, Ill.**

PLUG FOR RADIO—A new line of spark plugs designed to meet the requirements of vehicles equipped with two-way radio while still insuring good engine performance has been developed by Champion. The plugs feature improved resistor elements which are said to retain a more stable resistance under high operating temperatures and high voltage. This permits adequate suppression of engine noise, and at the same time offers peak engine performance. The new plugs prevent a drop in resistance under increasing engine temperatures, which is a principle cause of ra-

dio static. The new Champion plugs, identified by the prefix "X", are XJ-18Y, XJ-8, and XN-12Y.—**Champion Spark Plug Co., Toledo, Ohio.**

QUICKLY REMOVABLE—Snap-On-Digger Co.'s new hydraulic backhoe for small or medium-sized utility wheel tractors attaches or detaches from the tractor in 30 sec. To attach the backhoe, a single lever is connected and one hydraulic hose is coupled. After the backhoe is detached from the tractor, it stands on its own tripod and its two stabilizers. Another feature is that the backhoe bucket can be detached from the boom in less than 1 min. without the need for even hand tools. The backhoe has a digging depth of 12 ft, a loading clearance of 9 ft, and a continuous 190-deg swing controlled by the hydraulic system. According to the manufacturer, the backhoe attachment can be adapted for any tractor. — **Snap-On-Digger Co., 1115 W. 4th St., Winona, Minn.**



FULL CIRCLE BRAKE — A heavy-duty, full-circle brake for off-the-road equipment has been developed by Goodrich. Called the Hi-Torque, the brake is said to be the first hydraulic drum-type unit for earthmovers to provide 360-deg expander tube action. The new brake operates with nearly constant lining pressures at all points around the drum area. Only about one-half the us-

Instant

COLD WEATHER STARTING FOR *GASOLINE* AND *DIESEL ENGINES!*

REICHHELM

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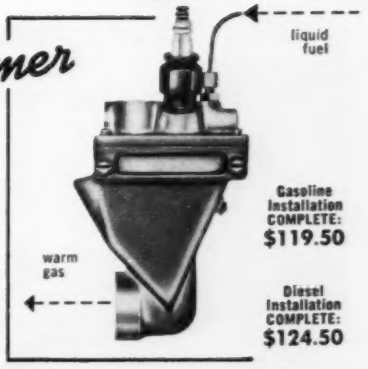

Installed permanently as an auxiliary carburetor, the GASIFIER primer is a self-heat-generating unit which vaporizes liquid fuel*, blends it with air to form a combustible mixture, and distributes mixture evenly to cylinders.

*On gasoline engines GASIFIER uses regular fuel; on diesel, bulk ether or low grade priming fluids.

Gasoline Installation COMPLETE: $119.50

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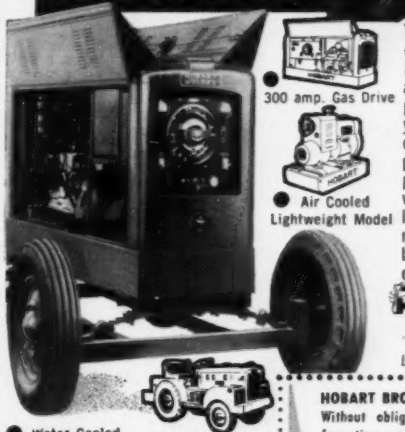
YOU'LL SAVE HUNDREDS OF DOLLARS DOING YOUR OWN ARC WELDING!



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You know how costly breakdowns are—the delays, replacement parts, the slowing up of important work schedules. You can eliminate all of these inconveniences with a Hobart portable welder. With an efficient Hobart you can weld anywhere, any time—do your own repairs quickly, in any part of your plant or project—independent of electric power lines. In addition, these Hobart welders can supply power for running tools, lights, motors, etc. Better check into these money saving Hobart welders. The coupon below will bring you complete information—quickly and without obligation.

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With millions of tons to move fast–

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GMC MONEY-MAKER DUMPS—like these Model 550's—are in on the moving of millions of tons of earth and rock—2,400,000 cubic yards of it from one spot alone. Their dependable hustle comes from GMC's 232-h.p. V8—the engine that won its spurs on extra-tough jobs like this one. Super-thrifty 6-cylinder power is available in other Money-Maker Models.

builders called for GMC's!

GMC Money-Makers available in models from ½ to 45 tons

BRAWNY GMC MONEY-MAKER TANDEMS—like this big Model W660—are holding down some of the toughest assignments on the Seaway project. Extra-stamina engineering—including full-length frame reinforcements installed at the factory—let users haul thousands of tons of steel—day after day—without strain. GMC Money-Maker Tandems blanket the 28,000 GVW-90,000 GCW field.

GMC's 2-CYCLE DIESEL POWER PAYS OFF—again and again—when you're hauling big loads up steep, underground passageways. Secret is the massive torque output that gives you pulling power to spare—even with a king-size load. And GM Diesel engines—dramatically improved in the newest GMC models—are already setting new efficiency and economy records for truck-users everywhere.

CONTRACTORS CHOOSE GMC PICKUPS for their on-the-job transportation and equipment-servicing work for just one reason: GMC light-duty Money-Makers are "built like the big ones"—with extra-stamina, extra-performance features that pay off in longest truck life—at lowest cost of all.

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AGAINST BREAKAGE

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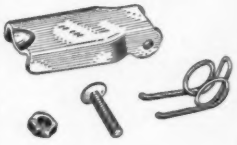
Load-Rated HOOKS

In ¾ to 150 ton capacities

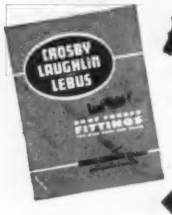
Now Crosby-Laughlin* offers you the highest guaranteed capacity *per size* in its "Load Rated" hook line. Choose from a complete selection of drop forged, heat treated hooks including eye, shank and swivel styles. Order these hooks the safe way—by capacity—in ¾ to 150 ton sizes. Every "Load Rated" hook has its safe working load stamped in the body for safety in selection—in use. Another feature: every Crosby-Laughlin hook (with drilled cam) can be converted to a safety hook at anytime. Stainless steel latch mechanism (right) attaches quickly—keeps the load in place until released.



"Load Rated" hooks are forged from new alloys that increase capacities by 50% without increasing hook weight! Every "Load Rated" hook is unconditionally guaranteed against breakage throughout its life.

All Crosby-Laughlin "Load Rated" Fittings are now painted bright RED—demand the "red fittings" and be sure of quality—keyword of the world's most complete line of drop forged fittings for wire rope and chain that includes Crosby "Red U-Bolt" Clips, wire rope blocks, shackles, "Missing Links",* grabhooks and turnbuckles!

*TRADEMARK



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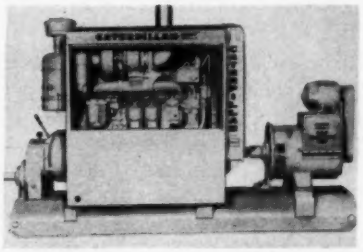
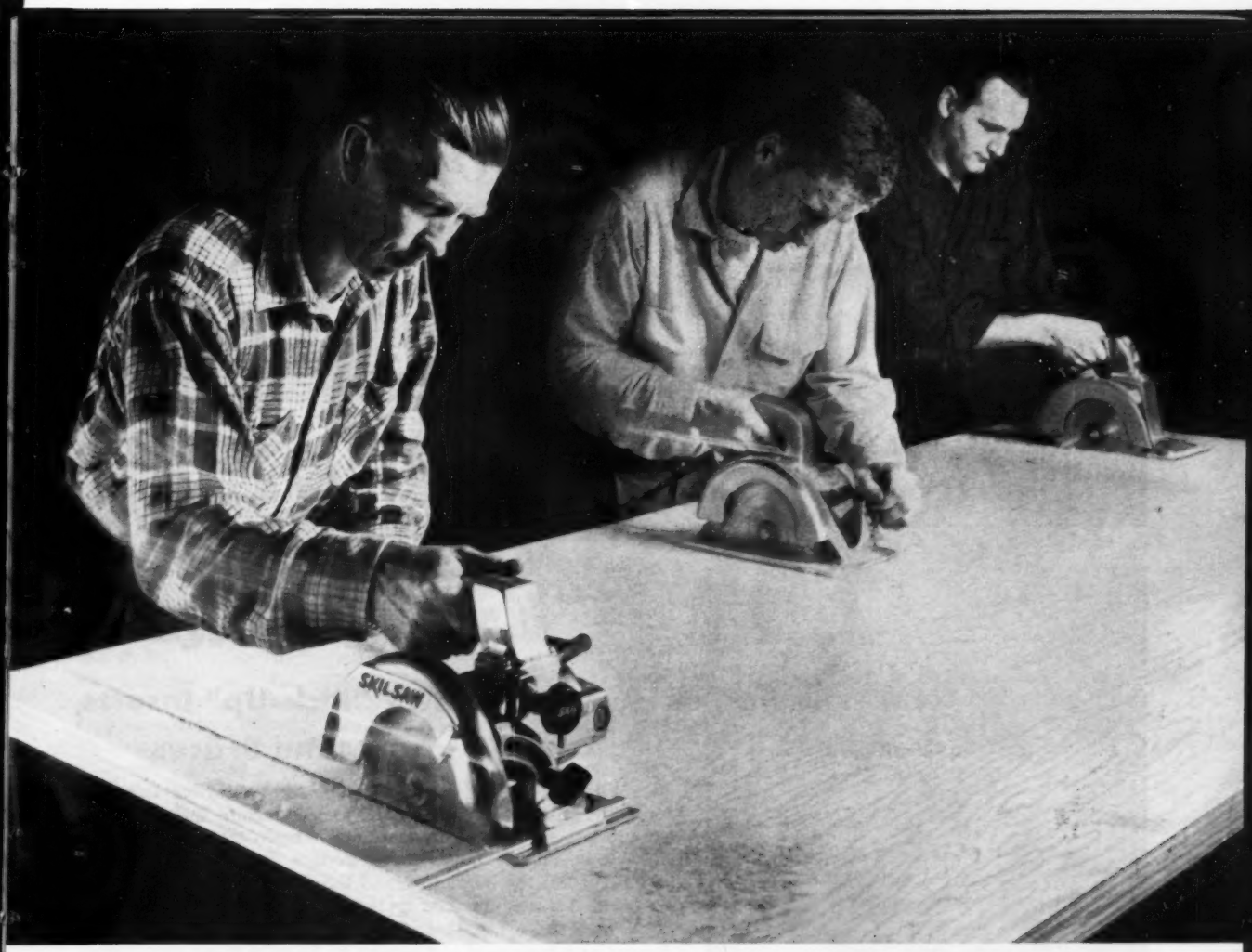
ual lining pressure is encountered when compared with anchored shoe brakes, according to the company, who claim the Hi-Torque has more lining contact area than any other brake. The Hi-Torque is said to be unusually simple to service. It requires no lubrication and it eliminates mechanical shaft or cam alignment problems. It can be disassembled with only standard hand tools, and lining changes are accomplished with only a screw driver and mallet. Available in most popular sizes for earthmoving equipment, the brake is bolted as a single unit to the axle or axle housing and uses either the existing air supply (with Goodrich's master cylinder) or hydraulic power from the central system.—**B. F. Goodrich Aviation Products, Troy, Ohio.**



COMBINATION DRIVE—Caterpillar's new D337 drive unit combines the portability of mechanical drive and the flexibility of electricity in one unit. Designed for crushing plants, the D337 drive unit simultaneously provides mechanical drive for primary and secondary crushers and electricity for conveyors and screens. The D337 takes power from both ends of the diesel engine's crankshaft. A clutch-controlled reduction gear delivers mechanical power at the rear of the engine, while a modified Caterpillar self-regulated, constant-voltage generator is mounted at the front. The generator produces 60 kw of 240-v, three-phase current. Both drive units operate independently, allowing either crushers or conveyors to run separately. The positioning of the generator and reduction gear at either end of the engine is said to result in short, rigid shafts that reduce flexing and cut down on vibration. The unit is designed for crushing plants delivering 150 to 200 tph of 1-in. material with



Test after test proves NEW SKILSAW top handle models have more speed and power

MODELS 857 AND 858 BEAT THEM ALL!

Actual laboratory tests made to duplicate job conditions prove the superior cutting ability and power of the new SKIL top handle saws. The photographed test shows SKIL Model 857 ahead of two comparative models after sawing through 2 layers of 5/8" exterior plywood. Power *plus* speed produce the first-place finish. Feature for feature these new saws beat all other 7¼" and 8¼" models. On similar tests for power, speed, efficiency, convenience—SKILSAW scores highest! Write today for more information or for an on-the-job demonstration by your local distributor at no obligation.

SKIL

*Skilmanship is the ability SKIL saws give you to perform your sawing jobs quicker, with more ease, more accurately and with less fatigue.

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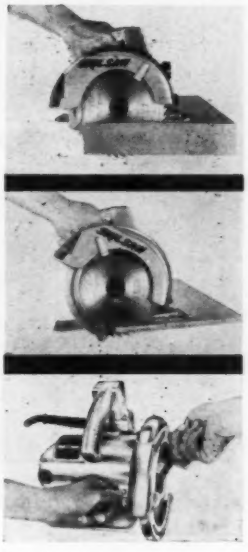
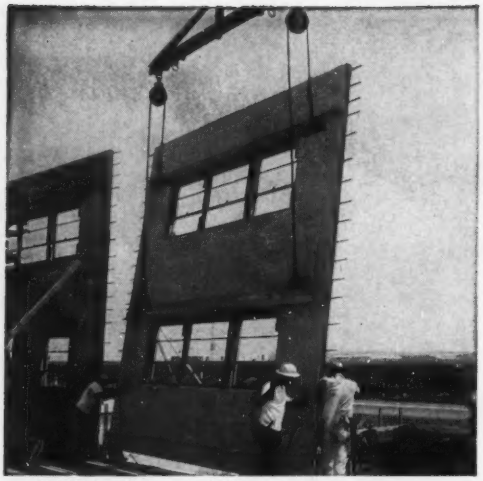
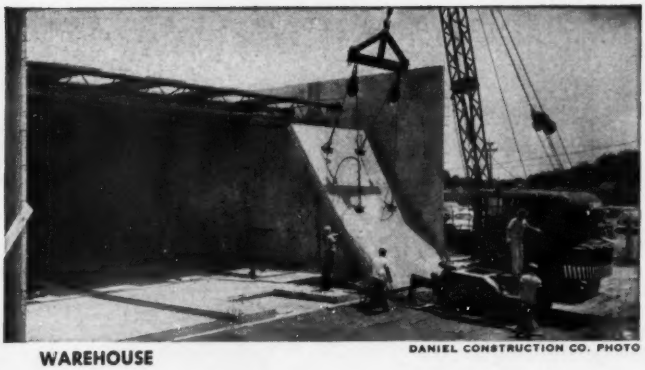
Floating Upper and Lower Guards Important new safety feature. Least amount of blade exposed at any time. Blade guards rotate with change in depth of cut. Another SKIL first!

Push Button Blade Lock. Fastest blade change on a power saw! Push-button lock engages saw shaft eliminating two-wrench change. Operation completed in seconds.





PANEL with large window areas



WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO

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When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that SUPERIOR products were used. The reason is simple. SUPERIOR, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

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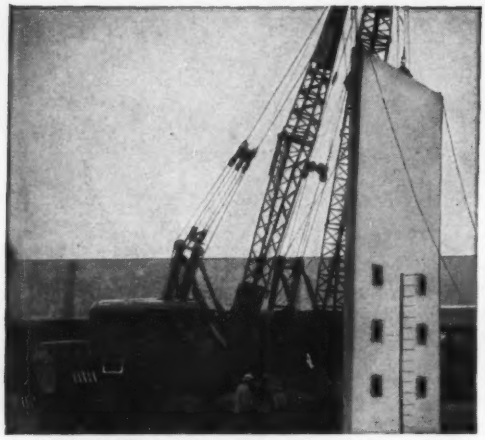
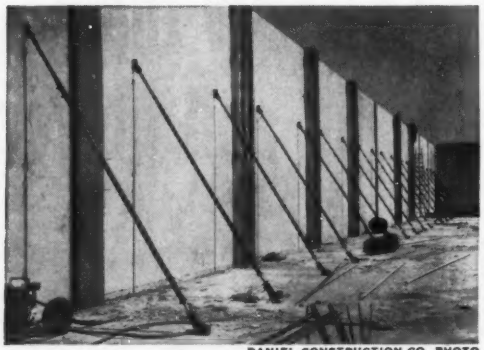


57 TON SLAB being positioned



DANIEL CONSTRUCTION CO. PHOTO

ADJUSTABLE BRACES used for quick and easy alignment of panels

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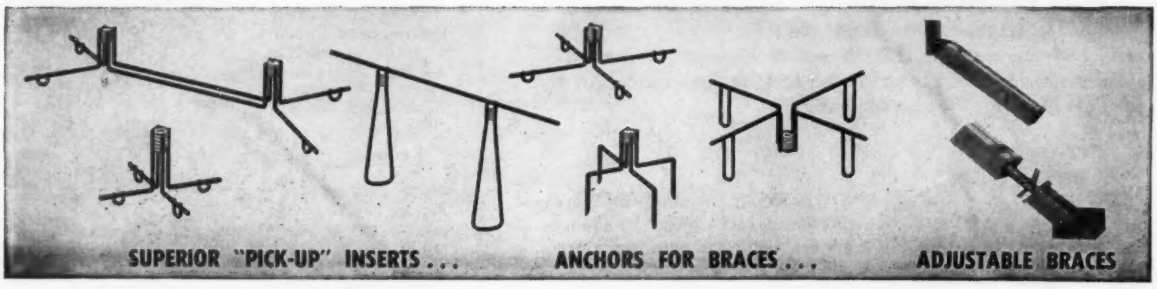


a 25% oversize factor. The Cat D337 diesel engine that powers the new drive unit is rated at 230 hp at 1,800 rpm. It is equipped with a turbocharger. The complete drive unit is 136½-in. long, 45 in. wide, and 80 in. high.—**Caterpillar Tractor Co., Peoria, Ill.**

FRONT TANDEM—Any model in the Crane Carrier Corp. line of carriers now can be equipped with tandem front axles—a design that boosts capacity, allows more clearance under the front axle, and enables the contractor to meet state laws on weight distribution. The tandem front axles are available with either two non-driving axles, or with one of the axles driving. The front tandems are available for the complete line of equipment carriers, including vehicles designed for 25 and 50-ton capacity truck cranes, ready-mix bodies, drilling rigs, and other on-and-off-the-road equipment.—**Crane Carrier Corp., P.O. Box 5008, Tulsa, Okla.**

CAR DESK—An 8x12-in. writing platform that attaches easily to the dashboard of a car or truck makes a convenient vehicular desk. The mounting bracket is held securely to the dashboard flange by a self-threading screw that can be adjusted sideways, backward, and forward. The desk has an indexing assembly that permits 18-deg position stops for a full 90 deg up and down. A 1-

for the very best in head protection, equip your men with WILLSON® Super-Tough phenolic safety hats and caps

Every day, more and more contractors across America are making sure their workers have maximum head protection by standardizing on the Willson Super-Tough *phenolic* safety hat. Scientifically designed to meet all specifications with ease, this is the strongest safety hat made . . . withstands 80 foot-pound drop-ball tests—40 foot-pounds more than Federal Specifications. And coupled with this added measure of safety and durability is the *extra comfort* a worker enjoys when he wears the Willson Super-Tough *phenolic* safety hat. No wonder its popularity keeps growing so fast out on the job sites. But don't just take our word for it . . . write today for name of your nearby Willson distributor and let him demonstrate the Willson *phenolic* on one of your jobs . . . see for sure why this is the *very best* head protection you can buy!

APPROVED WILLSON RESEARCH CENTER

SIX STYLE CHOICES—The Willson Super-Tough *phenolic* line includes six styles: Three hats and three caps with choice of "Geodetic," Standard, or Lace-In suspension.

SIX COLOR CHOICES—The natural finish of Willson Super-Tough *phenolic* hats and caps is an attractive blend of neutral browns and tans. Also available in spray-coated red, white, yellow, green, or gray for specific job identification. (Other colors on special order.)

WILLSON® PRODUCTS DIVISION
RAY-O-VAC COMPANY
141 Thorn Street, Reading, Pennsylvania

For FULL PROTECTION and Incomparable comfort . . .

FIBRE-METAL

HELMET and SAFETY CAP COMBINATIONS

No. 4706 -P-2Q

No. 602 -3-C

FIBRE and FIBERGLAS

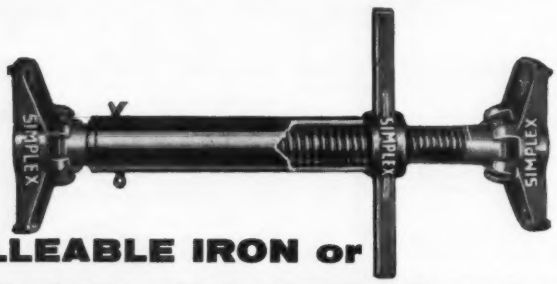
"Combinations" have *QUICK-LOK* Attachment! FIBRE-METAL features Light weight, Exceptional strength, Heat resistance, Wide range headsize adjustment, 4-position helmet stop, Durability and long life.

Fiberglas models are Moisture-proof (non-warping), Self-extinguishing and Easily sterilized.

Ask for Bulletin 39

THE FIBRE-METAL PRODUCTS COMPANY
CHESTER, PENNSYLVANIA

The WORLD'S LARGEST MANUFACTURER of SUPERIOR PROTECTIVE EQUIPMENT



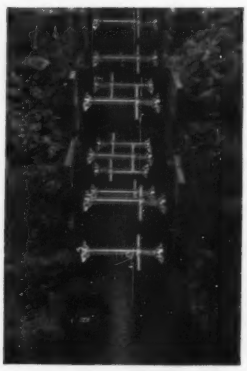
MALLEABLE IRON or

DROP FORGED?

Rugged dependability suggests that you insist on the best — Simplex *drop forged steel* trench braces.

Ball and socket joints at each end for tight grip at any angle. Blunt lever nuts or 3-way nuts — nail holes in both screw and butt ends. Furnished with or without pipe.

Simplex drop forged steel trench and timber braces *cost no more* and better eliminate the danger of cave-ins and costly re-digging.



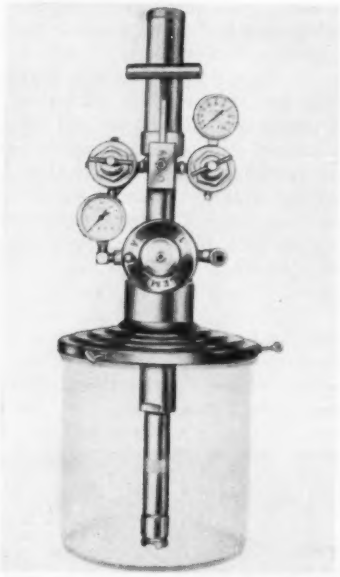
WORLD'S LARGEST MECHANICAL AND MFGRS. OF INDUSTRIAL HYDRAULIC JACKS

SIMPLEX JACKS

RE-MO-TOOL UTIL-A-TOOL JENNY ROL-TOE

TEMPLETON, KENLY & COMPANY
2509 Gardner Road
Broadview, Illinois

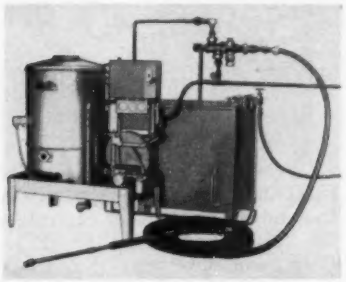
in. deep basket for storing papers is welded underneath the writing surface. This is enclosed on three sides and the fourth side has a retaining spring to prevent papers from being lost. When the ball point pen that comes with the desk is removed, it releases the spring and papers are available in the sequence in which they were filed. The desk portion is easily detachable from the indexing bracket so that the driver can carry it with him in the field. The vehicular desks are priced at $17.50 each. A 6 or 12-v Nite Lite is available as optional equipment. — **Product Development Corp., P.O. Box 38, Mt. Ephraim, N.J.**



SHOP PUMP—Alemite's new air-powered pump handles a wide range of protective and finish materials, including lacquers, enamels, primers, sealers, vinyls, epoxys, and strippable coatings directly from 5-gal cans. Ideal for metallic base paint applications, the pump offers automatic, constant agitation that assures color consistency. The pump delivers a constant flow of material, even to spray guns with exceptionally long hose lines. Called the Porta-Pump, the unit is compact and lightweight and is easily portable without dollies—even when fully loaded. The entire unit, which weighs 35 lb, consists of pump, cover, handle, air regulator to pump, atomizing air

regulator and gage, and material pressure regulator and gage. The pump and accessories are zinc plated. The pump has a ¼-in. air inlet, a ⅜-in. air outlet, and a ⅜-in. material outlet.—**Alemite Div., Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.**

NO HP LOSS—The loss of engine horsepower caused by a lack of oxygen when operating an engine at high altitudes can now be overcome on the Caterpillar D6 crawler, thanks to a new Normalizing Kit. The new kit, which consists of a turbocharger and all manifolds needed to mount it on the tractor engine, delivers air to the inlet manifold at greater than atmospheric pressure, thus permitting complete fuel combustion at high altitudes. For example, when operating at an altitude of 8,000 ft the normalized D6 will operate at the machine's sea-level rating of 90 hp; without the turbocharger, the D6's rating would be 79 hp. According to Caterpillar, the normalizing kit does not increase the horsepower of the tractor while operating at sea level. It is effective only in providing the needed oxygen at high altitude to burn the same amount of fuel as it would at sea level. Similar kits are available for the D7 and D8 crawlers.—**Caterpillar Tractor Co., Peoria, Ill.**



STEAM OR STREAM—The Clayton-Sellers combination steam and hydraulic jet cleaner offers either high impact steam for close-up cleaning or a hot hydraulic jet stream for cleaning hard-to-reach places such as crane booms, truck bodies, etc. Used as a steam cleaner, it produces 280 gph at 90-100 psi. It can also be converted to a two-gun steam cleaner at 140-gph per gun. As a hydraulically operated

You can't set your sights too high

For digging . . . for handling material . . . for any clamshell work—OWEN Buckets perform giant size jobs day in and day out. OWEN'S designing and engineering experience, gained through 50 years of manufacturing Clamshell Buckets exclusively, has developed a product that is guaranteed to out-perform any other make. Remember—the bucket is the working end of the boom and it is of the utmost importance that there is absolute assurance the bucket will do the job.

This experienced "know-how" in design and engineering has contributed to the origination of the only independent tine action Grapple to handle rock, scrap metal or pulpwood. The same unequaled quality construction in OWEN Clamshell Buckets is in OWEN Grapples.

OWEN Engineers are at your service any time at no cost to you. Send us your needs, stating exactly what are your requirements. We should have the answer that will "fit the bill to a T".

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

What you should know about

MIL-CARB® "NUBBIN" WASHERS for High Strength Bolted Steel Construction

The word "Nubbin" on the container and the nubbin on the rim of the washer are the trade-mark symbols indicating *quality* washers manufactured by WROUGHT WASHER MANUFACTURING CO.

All washers having a nubbin on the outer rim, as shown in the accompanying illustration, are heat-treated washers manufactured by the Wrought Washer Mfg. Co. for use in connection with high strength bolted steel construction or other purposes for which they may be designated.

This is our own exclusive product and trade-mark. It signifies that washers so identified are manufactured to our high standards, insuring uniform quality control, always *equal to* or *exceeding* the rigid specifications that have been established for high strength bolted steel construction (ASTM designation: A325, applying to nuts, bolts and washers).

All "Nubbin" Washers are fabricated from Special Soundness Steel to provide washers comparable to the best nuts and bolts in high tensile strength and permanent non-galling holding power.

[**For your own protection, to insure uniformly sound construction, specify Milwaukee Wrot Washers with the "Nubbin" trade-mark on the rim . . . the symbol of *quality*.**]

Since 1887

Distributed by

Leading Nut and Bolt Manufacturers and

U.S. STEEL SUPPLY DIVISION

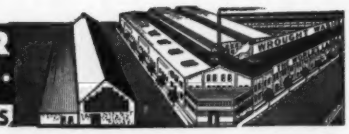
UNITED STATES STEEL CORPORATION

208 So. La Salle Street • Chicago 4, Illinois

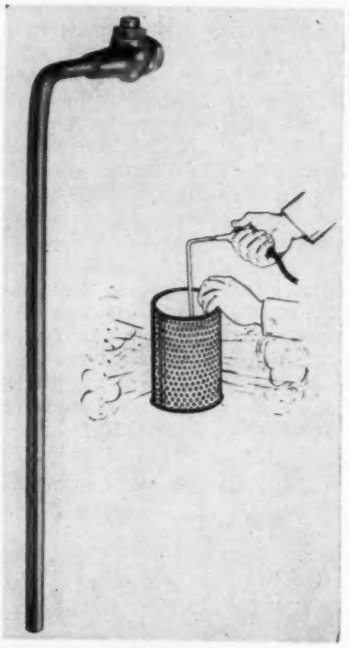
WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

2247 S. BAY ST., MILWAUKEE 7, WIS.



cleaner, the unit delivers 500-600 gph at 220-psi to 210-deg F. A ¾-hp motor powers the hydraulic unit. The Sellers hydraulic jet unit utilizes the steam developed by the pumping and projecting action of the Clayton steam generator. The energy of high pressure steam is converted into a hot water hydraulic jet with a velocity in excess of 150 ft per sec. The jet will carry effectively for distances up to 50 ft, according to the manufacturer. Soap or detergents can be added to the stream if desired. The hydraulic jet cleaning unit is manufactured by Sellers Injector Corp.—**Clayton Mfg. Co., Box 550, El Monte, Calif.**



FILTER CLEANER—A new way to hand-clean air filter cartridges has been introduced by Fram Corp., who have developed a new air gun to handle the job. The gun has a long, narrow nozzle with a series of holes that allow a metered air flow to clean cartridges from top to bottom from the inside. The gun attaches easily to a hose connected to a compressed air supply. A push button provides easy on-off control. The air gun is ruggedly constructed of brass and cadmium-plated steel.—**Fram Corp., Providence 16, R. I.**

continued on page 217

Doing as much as three power shovels and a dragline, this TD-18 4-In-1 dug up, and loaded, up to 1,700 feet of old concrete pavement daily—for Henry E. Berghuis, Prinsberg, Minnesota. Famous pry-action break-out makes the big difference over other rigs!

Don't let a single-action loader hold you up... see how a 4-in-1 multiplies your profit-range by four!

You've got a gun in your back two ways—with an old-style, single-action "dip-and-dump" tractor loader!

It holds you up on price, by giving you only the one machine action for your money. It hijacks profits, by sharply limiting job range and capacity.

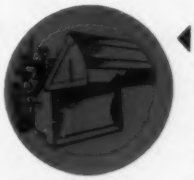
Now, see what a contrast, in multiplied value and earning power, an International Drott 4-In-1 offers!

4-machine utility — one-machine price!

An International Drott 4-In-1 gives you four built-in, multiple-duty, big-capacity machine actions, for only a one-machine price. Your fingertip command, through the "machine-selector" lever, instantly puts any 4-In-1 action you need at your service.

Skid-Shovel action gives you exclusive, "concrete-smashing" pry-action break-out—with famous bucket-heaping, ground-level roll-back. "Carry-type scraper" is your accurate grading, stripping, spreading, or compacting action. Clamshell action provides one-gulp "stand-and-fill" ability, plus hopper-high, self-cleanout, bottom-dumping. Bulldozer action delivers aggressive, big-yardage, earth-rolling ability.

Ease into the foam-cushioned seat—prove that your 4-In-1 investment will multiply your job-taking, money-making ability. And compare the performance protection of exclusive shock-swallowing Hydro-Spring to unprotected hose-bursting, machine-mauling "lunge-and-lift" design. Ask your International Drott Distributor to demonstrate the top buy, by far, in the construction machinery world: the 4-In-1 size that fits your needs!



Bulldozer... with clam lip up and shoes on the ground, it's a big-yardage, earth-rolling blade!

"Carry-type scraper" ...that grades, strips, or spreads with inch-close accuracy.

Skid-Shovel . . . with Drott's exclusive pry-over-shoe break-out and ground-level roll-back.

Clamshell... that fills itself in one fast gulp — gives you hopper-high, self-clean-out dumping.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Why a TD-24 'dozes full blades *where other rigs spin and*

You don't have to jockey around, or settle for "shirt-tail" loads, or get only part-capacity performance, when you concentrate the International TD-24's full rock-slamming power—right where you want it!

You don't waste time, and fuel, and tractor life with rear-end "sluing." You don't have to "paw dirt" and then wind-up "nibbling," instead of blading out full bites. You don't lose momentum and let the blade lose part of the load every time you steer. Not with TD-24 "follow-through"!

Exclusive International Planet Power steering makes the big difference.

"Dead-track drag" is eliminated

You don't "half-kill" your power and traction to guide the TD-24, as you must with any king-size steering clutch tractor. Instead, Planet Power steering gives you full-time "live" power on both tracks while turning—or while "equalizing" to steer accurately with offset loads. And the TD-24 handles the same big loads on turns or straightaways!

Besides, the TD-24 gives you cycle-speeding, on-the-go Hi-Lo shifting. You adjust speed to the load without stopping, going forward or in reverse. You speed up the shuttle-dozing cycle, take full-time advantage of the TD-24's full capacity!

The fingers of one hand control these TD-24 performance exclusives!

Watch a TD-24 perform—see why rock-movers call it the "rock-dozing special." Visualize how this load-control and bonus capacity make the TD-24 the ideal pusher, or outstanding for non-stop, big scraper pulling! See your International Construction Equipment Distributor for a demonstration.

Put one track in high range, the other in low—and the TD-24 pushes straight ahead, despite the tremendous offset load of benching-out unshot rock strata. P. C. Cooper, Blountsville, Tennessee, first rented this TD-24—then bought it because of its rock-'dozing performance!

An 8-unit TD-24 fleet owned by Rusciano and Sons Corp., replaced 8 big competitive crawlers—because TD-24 performance "measured up" to the toughness of this big road job. There was a considerable tonnage of granite and other rock to bulldoze—on the White Plains (N.Y.) Section of the 'Cross Westchester Expressway!

"With the TD-24, I can outwork any other machine where you have to push and turn with a big load," declares Operator Dan Olmstead, for Gibbons & Reed, Salt Lake City, Utah. "The TD-24 keeps the load moving, because you don't lose power braking a track." The TD-24 is spreading rock on a tough million-yard project—widening U. S. 40 in the Truckee River canyon near Reno.

# of rock *stall!*

International® *Construction Equipment*

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

WOW! a complete new line of full IH factory warranty... quality

10 hp International Cub® Lo-Boy®... lowest cost tractor-help you can get for cutting costs on a wide range of the lighter jobs. You'll be amazed at its productive capacity! Loader lifts 6 cu ft or 450 pounds.

23 hp International 130 gives you utility loader service at low cost... holds down your investment for equipment on odd jobs and seasonal needs. Loader can be used in combination with mowers, blades, etc.

35 hp International 330. New and really *rugged!* Has the built-in 'beef' to handle 1,000 pounds with front-end loader; step up yardage with choice of heavy-duty backhoes that maintain grades, digging 10 or 12-ft ditches.

6 Power sizes . . . unit-engineered for top capacity at lowest cost!

45 hp International 350, with gas, diesel, or LPG engine. Has the built-in brawn to handle ¾-ton with heavy-duty loader. Three models of heavy-duty backhoes match your job and your pocketbook for lowest cost.

57 hp International 450. Over 6,600 pounds built-in operating weight. Loaders handle ¾-cu yd buckets, lift 2,000 pounds over 10 feet. Backhoes take bites up to 10 cu ft, dig 12 or 13½ feet deep.

67 hp International 650 diesel gives you trenching capacity approaching that of small power shovels, with wheel tractor economy and mobility. Loads up to 2,500 lb, digs ditches to grade, as deep as 12 feet.

loaders and backhoes

service and parts available *everywhere*

Whether you buy on price, performance, or service —or all three together—you'll find today's best buy in tractors, loaders, and backhoes at your International Harvester Dealer's. The reasons are many...all sound:

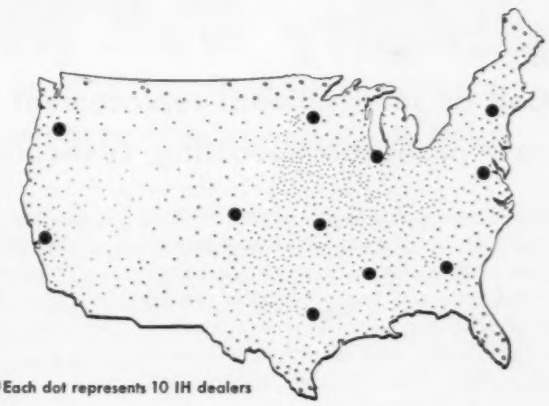
Exclusive high-capacity loader and backhoe designs, manufactured for International Harvester by Pippin and Wagner—recognized leaders in the field.

Fully warranted and nationally distributed by International Harvester Company. Factory-mounting available.

Sizes to match your job most economically—Nine loaders for *six* power ratings of International® tractors, 10 to 67 hp . . . five backhoes and backhoe-loader combinations for 35 to 67 hp models.

Exclusive protection against costly down time—Tractor, loader, and backhoe parts stocked by IH Dealers and at all IH parts depots. (see map)

"One stop" sales-service for all your tractor-loader-backhoe needs saves you time and money . . . see your International Tractor Dealer!



● Each dot represents 10 IH dealers

● IH Parts Depots

No matter where your job is located, you'll find well-equipped parts and service facilities nearby in the hands of a capable, experienced IH tractor dealer and his factory-trained mechanics. His facilities, in turn, are backed by the industry's most extensive network of parts depots.

One of the 5,000 IH Dealers is near you. See him for the tractor-loader-backhoe combination sized and priced to meet your specific job requirements. He'll gladly demonstrate! **Financing?** Ask him about the IH Income Purchase Plan.

SEE YOUR

INTERNATIONAL HARVESTER DEALER

International Harvester Products *pay for themselves in use* . . . Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois

Stop paying a partial production penalty with pooped-out power

Call an International replacement engine specialist for new production-boosting, cost-cutting power

When the engines in your powered equipment are beyond the reasonable repair stage, you start paying a heavy down time and lost production penalty every day you keep them on the job.

That's the time to call in a repower specialist – your nearby International Power Unit Distributor or Dealer. Here's how he can help restore original equipment production:

- Expert analysis made on the job with replacement power check charts.
- Assistance, when required, from International repower engineers.
- Closely matched power from a dependable, economical diesel or carbureted engine in the International line. No under-powering, no need to buy excessive horsepower.
- Fast installation, when desired, and exceptional after-sale service backed with a complete parts stock and always-available service facilities.

Call him in and get his estimate on your next repower job. You'll like production-boosting International power and the service support you get from the man who sells it.

Smooth-performing UD-350 diesel power unit with gear type balancer is but one of 20 dependable, economical repower choices available in the International line. Power range: 16.5 to 250 net hp with your choice of fuel.

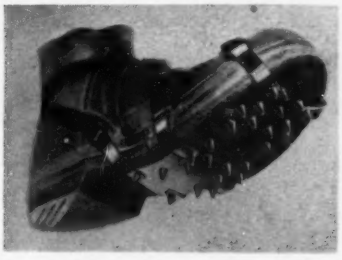
International®

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois

Construction Equipment

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

MOVABLE SCALES—Howe now produces portable vehicle scales that do not require a pit or other permanent installation — thus making it easy to re-locate them as the job moves along. They are available in capacities up to 70 tons and in lengths to 60 ft. The scales use Howe's patented suspension assembly, which is said to absorb loading shocks and to reduce wear on the scale pivots. A wide variety of weight indicators is available, including standard beam, recording beam, dial, remote dial, and other weight recording devices.—**Howe Scale Co., Rutland, Vt.**



LIFE SAVER—An inexpensive, easy-to-attach steel sole that might be a life saver for men working on icy surfaces, wet wood, or slippery stone has been marketed by Industrial Products Co. The sole, made of tempered spring steel, is thickly studded with sharp, pointed calks. Web straps, which attach easily to work shoes, hold the sole in place securely. The sole is finished with a transparent rust-proof lacquer. —**Industrial Products Co., 2715 N. 4th St., Philadelphia 33, Penn.**

GOOD VISIBILITY—A 2¼-yd capacity tractor-shovel, the model 200, is the latest addition to

New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

The new Gurley transit is furnished with a tripod with built-in shifting head, and allows a two-inch shift of the instrument over the point. This provides greater latitude in initial set-up.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, ask for Bulletin OP-100.

GURLEY

W. & L. E. GURLEY 521 Fulton Street, Troy, New York

Gurley—Since 1845

NEW A-W ROLLER-COMPACTOR*

Three states prove that machine makes large savings possible

Deep penetration vibratory compaction and static weight surface rolling can now be accomplished in a single pass by the new A-W Roller-Compactor. On-the-job operation of this dual machine in Oklahoma, Louisiana and Pennsylvania has shown that it can make significant savings in man and equipment-hours.

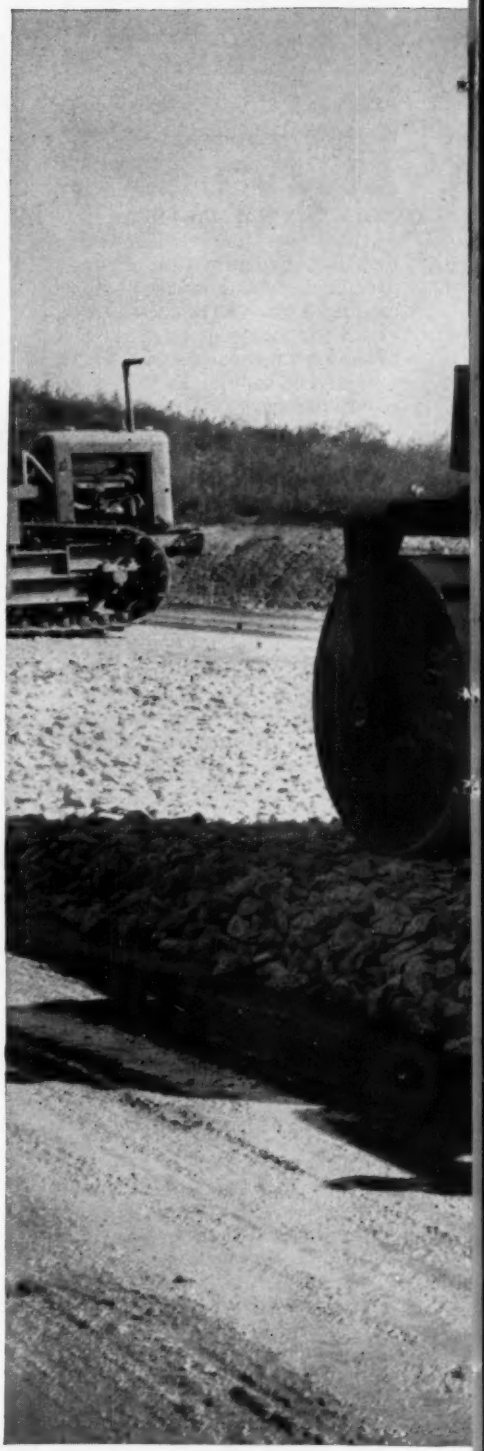
The original test in Pennsylvania, which led to State approval of the machine, was carried out on a highway relocation job near Harrisburg. Preparation of the roadbed required straight excavation, with no borrow. Largest fills were 25 ft. After grading and soil compaction, stone for a 10-in. thick base was put down in a single lift. All the stone passed a 4-in. screen, 85-100% a 3½ in. Following spreading and initial compacting with the A-W Roller-Compactor, the stone was choked with screenings, 100% passing a ⅜-in. screen, 85-100% a No. 4 screen, 10-30% a No. 100.

In this operation, the static weight of the roller (10 tons) held the stone in place while the deep, penetrating action of the vibrating shoes quickly filled the voids with screenings. No auxiliary rollers were necessary.

Engineers of the Pennsylvania Department of Highways testing laboratory checked the job with inspection holes to determine if the screenings were evenly distributed throughout the thickness of the stone base and if the stone itself was firmly keyed together. This check, plus measurements based on the yield needed to compact 1 cu. yd. to the required 10-in. depth, showed that the new machine had done a job exceeding the minimum requirements. The engineers then recommended that it be approved for highway construction work in Pennsylvania.

Time studies on this job showed a saving in man and equipment-hours of better than 25% compared with methods then employed which used a single-purpose vibratory compaction unit followed by a separate 3-wheel, 10-ton roller. It was estimated that a contractor using the A-W Roller Compactor on stone base could reduce his compaction bid by 10c per sq. yd.

Spectacular results were also obtained with this machine in on-the-job operations in Oklahoma and Louisiana. For complete test details and for technical information on the A-W Roller-Compactor, see your nearby A-W distributor or write to us.



COST ANALYSIS OF A JOB IN OKLAHOMA

Equipment	No. of lifts required	Rolling time per lift (hr.)	Equipment time (total hr.)	Cost per hr.	Total cost per mile	Savings
Sheepsfoot roller and two pneumatic tire rollers	9	8	216	$12.50	$2700	—
A-W Roller-Compactor	4	11	44	$12.50	$550	$2150

This cost analysis of compaction work on soils and stabilized gravels in McCurtain County, Okla., reveals the remarkable cost reduction made possible by the A-W Roller-Compactor. Additional savings resulted because (1) Less water was required for sprinkling—the deeper lifts used with the A-W retained moisture better during compaction; (2) the roller-compactor method required only one machine and operator instead of several pieces of equipment with an operator for each; (3) motor graders and water wagons could be used more efficiently, because they could prepare material ahead of the compacting area without having to stand by for compaction of each 2-in. lift.

*Patents applied for

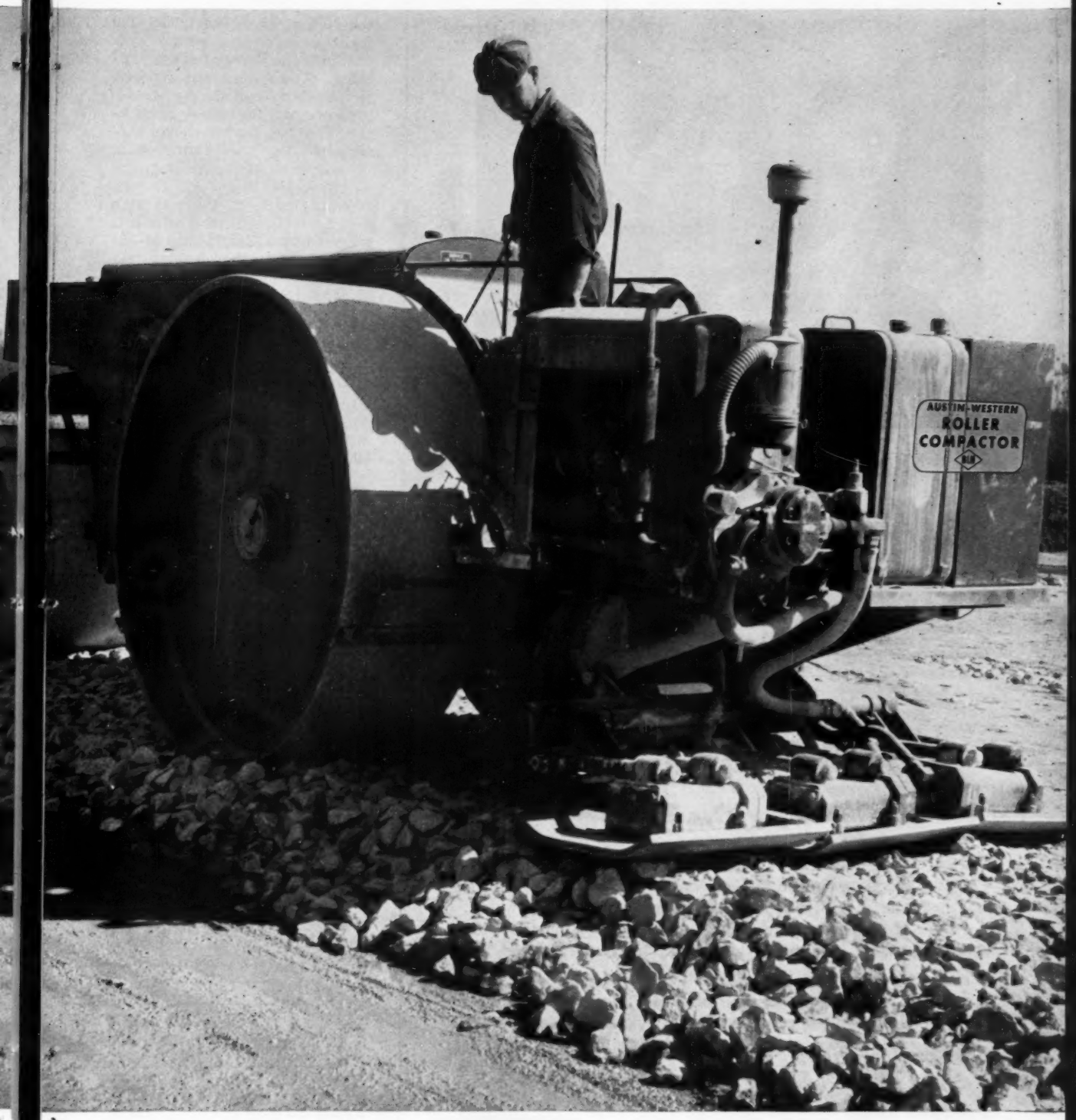
Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

CUTS HIGHWAY BUILDING COSTS



Dual-purpose A-W Roller-Compactor serves both as vibratory deep penetration type compactor and static weight roller type surface compactor for stone, gravel and soil subbases used in the construction of highways and runways. Shown in use on a highway relocation job near Harrisburg, the machine has been approved by Pennsylvania for complete compaction of stone base aggregates up to 10 in. thick on highway construction in that state.

(Advertisement)

tool idea by Standard

Demonstration of wrench in action. In actual practice, a strap wrench is used in conjunction with the above wrench to prevent it from slipping from nut.

new timesaving wrench by Snap-on*

Standard Oil Company of California needed a wrench to tighten bolts to high tensions . . . eliminate safety hazard of striking wrench with a sledge hammer . . . save time . . . overcome close-quarter limitations.

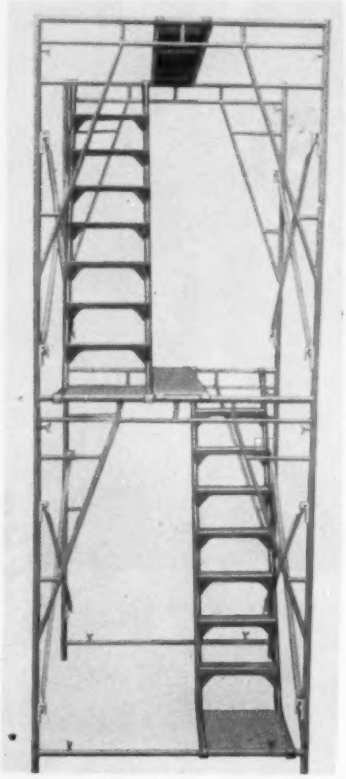
One of Standard's maintenance foremen conceived the idea of using an air-powered wrench. He outlined his thoughts to *Snap-on* sales engineer, W. F. Egbert. From their combined ideas, Standard built working models using regular *Snap-on* sledge wrenches.

Using these models, *Snap-on* made detailed drawings, then furnished the industry's first cupped-slugging wrenches. The striking surface is cupped so that a bull-nosed driver, inserted in an air-powered rivet buster, can impact the wrench from various angles to tighten the nuts. This tool answered all requirements outlined above.

Whatever your tool problems, *Snap-on* can render a specialized service. Branch offices and warehouses are located in key cities throughout the U.S. and Canada.

*TRADEMARK OF
SNAP-ON TOOLS
CORPORATION
8042-B 28th Avenue • Kenosha, Wisconsin

the Nelson line. The model 200 features underslung bucket arms that give the operator 100% visibility. At no time does any object, such as cylinders or hoses, protrude past the operator's cockpit. The new tractor-shovel features 40-deg bucket tipback at ground level. Maximum dumping height is 9½ ft, and a 5 ft 7 in. forward reach is achieved at a 7-ft dumping height. The unit is powered by a Continental M-363 gasoline engine that develops 117 hp. A GM-3-71 diesel engine is optional. An Allison Torqmatic reversing transmission and four-wheel - drive Timken - Detroit planetary axles with a torque proportioning differential are standard. The model 200 weighs 19,500 lb with a gasoline engine and 20,100 lb with a diesel engine. **—N. P. Nelson Iron Works, 850 Bloomfield Ave., Clifton, N.J.**



PACKAGED STAIRWAY—The Patent Scaffolding Co. has developed a steel plank and stairway unit designed to be used with the company's Trouble Saver sectional steel scaffolding. The steel stairways, which weigh 75 lb

WIRE ROPE AT WORK

This hungry shovel, doggedly eating away at a steep embankment, thrives on a diet of dirt and rock. While working in the vicinity of York, Pennsylvania, it scooped out an average of 2,000 cu yd per day with its 3½-yd dipper. The job: preparing right-of-way for a new express route between York and Baltimore.

In places a deep cut was required, and the digging had to proceed at a steady pace, free of interruptions. The contractor, J. Robert Bazley Inc., guarded against wire rope failures by rigging the shovel with Bethlehem Purple Strand. This tough wire rope was furnished in the 6 x 25 construction for both hoist and boom lines. As always, its high strength and durability were important factors in keeping the shovel going full-tilt.

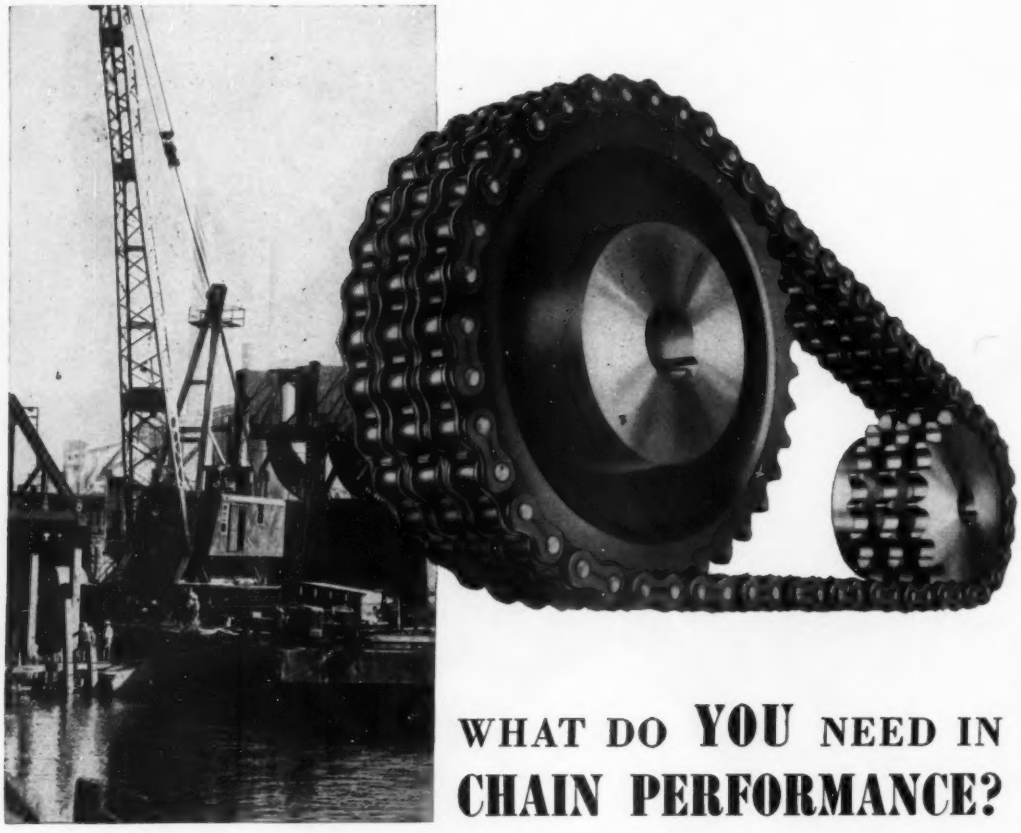
Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE

BETHLEHEM STEEL



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What you *need*, you *get* in Whitney's new, *fatigue-resistant* Processed Roller Chain.

This new development in heavy duty chain is keeping construction on schedule profitably . . . establishing new service records on leading construction equipment. You get this kind of performance from the exclusive Whitney Process which *offsets* excessive operational stresses in the chain. This means ruggedness to spare—the ability to *withstand heavy shock loads* under the severest operating conditions.

Still another important design advance is Whitney's High-Capacity Roller Chain. If limited space or weight are serious factors in power transmission, this new, *compact* chain drive may provide a solution. Factory trained field engineers are always available for practical recommendations on all of your chain and sprocket design problems. And you can rely on your nearby Whitney Chain distributor for fast off-the-shelf service from his complete line of ASA roller chains, conveyor chains and stock sprockets.

New . . . Whitney's packaging includes plastic enclosed disassembled chain parts for easy chain assembly, handling and parts inventory . . . Another exclusive Whitney service!

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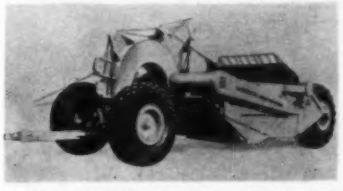
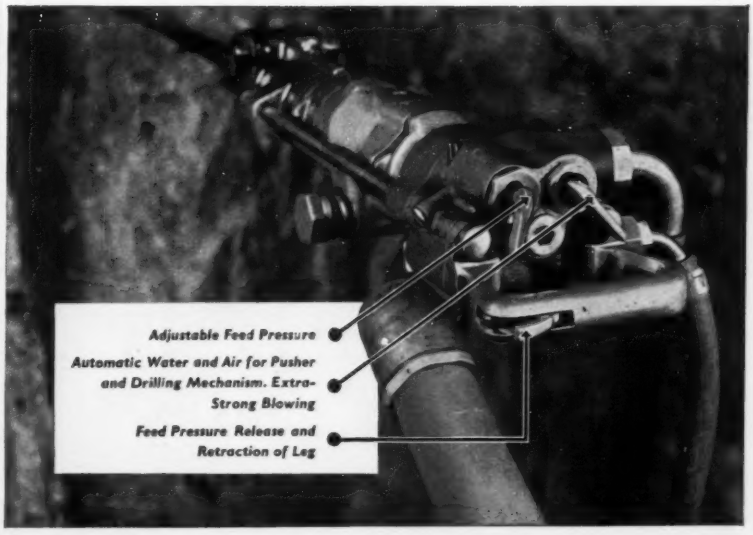
ROLLER CHAIN • CONVEYOR CHAIN • SPROCKETS • FLEXIBLE COUPLINGS • WHITNEY-TORMAG DRIVES

each, are made for 6½-ft frames on 7 ft spacing. With stationary scaffolding the bottom stair unit can rest on the ground; for off-the-ground sections or for the bottom section of a rolling scaffold, a ledger or similar horizontal member is used. The 11⅝-in. wide planks are available in 6, 7, and 10-ft lengths. Stairway sections can be used with or without the steel planking. Both units have non-slip surfaces. Included among recommended applications for the packaged stairways and planks are their use as personnel access stairs for top additions to buildings when workers cannot use inside stairways; and for high bridge construction where the use of stair towers can minimize walking time in getting men to their jobs.—**Patent Scaffolding Co., Inc., 38-21 12th St., Dept. CM&E, Long Island City, N.Y.**



TRACTOR-DRAWN SCRAPER—A new 18-yd scraper for use with tractors of 90 or more horsepower has been added to the Le-Tourneau-Westinghouse Fullpak line. Called the CT scraper, it is patterned after the big 27-yd BT model introduced earlier this year. The CT features a clean, smooth bowl design that keeps resistance to a minimum when loading or unloading. The bowl floor, which provides more than 46½ sq ft of load base, measures only 59 in. from the tip edge of the cutting blade to the face of the tailgate so that the distance material must travel during loading is held to a minimum. With only a 2-deg floor tilt, the scraper bottom remains nearly flat in loading so that material does not have to travel up hill to get into the bowl. The cutting edge is 9½-ft long, three-section blade. Rear wheels track well within cut width. To provide maximum boiling and rolling action during the loading process, the CT has a curved deflector plate and a grid on the top of the tail gate structure. On a spread, the apron swings up to provide an opening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Automatic Water and Air for Pusher and Drilling Mechanism. Extra-Strong Blowing
Feed Pressure Release and Retraction of Leg

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ATLAS COPCO LION

the most remarkable heavy-duty pusher-leg drill on the market

The Lion is the only rock drill with retractable leg operated from the backhead, which means quicker repositioning. It is also one of the very few drills on the market with all the operating valves controlled by one hand. Both these features make for great savings in time and manpower: in addition, the Lion has an especially high drilling speed compared with other drills in the same class.

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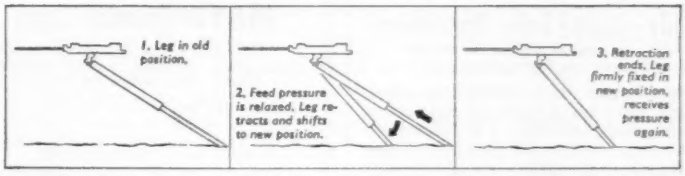
With the Lion choose Sandvik Coromant tungsten-carbide-tipped integral steels—the most widely used in the world—or Sandvik Coromant detachable bits and extension steel equipment.

PUSHER LEG ADVANCES WITH DRILL IN ACTION


1. Leg in old position.
2. Feed pressure is relaxed. Leg retracts and shifts to new position.
3. Retraction ends. Leg firmly fixed in new position, receives pressure again.

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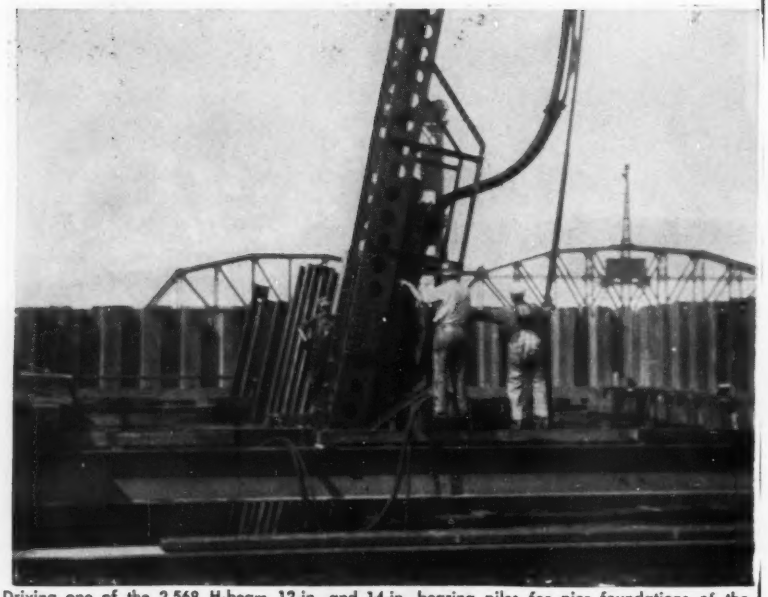
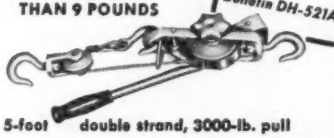


Driving one of the 2,568 H-beam 12-in. and 14-in. bearing piles for pier foundations of the 9,500-ft bridge over Newark Bay on the new 8-mile expressway connecting the New Jersey Turnpike with the Holland Tunnel under the Hudson River to New York City. The piles ranged from 67 to 128 ft long, and had to be driven with extreme accuracy through sticky soil to rock. To drive the piles, the contractor, Dravo Corporation, used 9B3 and 10B3 Double-Acting Pile Hammers and an S8 Single-Acting Pile Hammer manufactured by McKiernan-Terry Corporation, 110A Richards Ave., Dover, New Jersey.

WRIGHT Type "R" Pull-A-Ways

WEIGH LESS THAN 9 POUNDS

Write for Bulletin DH-521A



5-foot double strand, 3000-lb. pull

14-foot single strand 1500-lb. pull

Sturdy • Light • Safe • Economical

Here are some of the fine features of WRIGHT Type "R" Pull-A-Ways:

Drop forged ductile aluminum alloy frame • Wire hoist cable of maximum strength and flexibility • 8" minimum handle movement—for close hook-ups • 2" drum hub for cable • No oiling needed • Drop forged steel hooks • Removable, reversible "Safety Handle" that bends before any part of hoist is overloaded • Automatic load lowering, with positive control for safety.

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MAYO Tunnel Cars

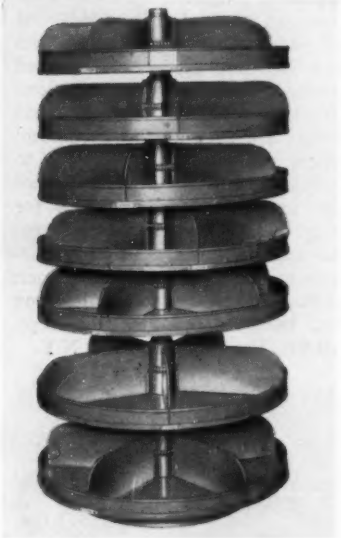
. . . feature practical designs and rugged construction. All cars can be equipped with Mayo's safe, automatic couplers.

- **Side Dump Car** (shown) has 2½ cu. yd. capacity. 24" gage.
- **Rocker Dump Car** Ideal for sticky muck or wet concrete. 1 cu. yd. capacity. 24" gage.
- **Tunnel Car.** Box body is removable and may be hoisted to surface to be dumped into truck. ½ to 2 cu. yd. capacity. 18" or 24" gage.

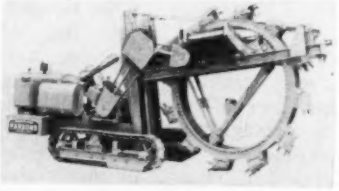
FREE Bulletin No. 22 shows car details, automatic coupler, other Mayo tunnel haulage equipment.

MAYO
TUNNEL AND MINE EQUIPMENT
LANCASTER, PENNA.

5½ ft high for quick discharge. Standard tires are two 18.00-25, 20-ply tubeless on the front and two 26.5-25, 26-ply tubeless on the rear. The price of the CT with standard tires is $13,716, fob, Peoria. — **LeTourneau-Westinghouse Co., Dept 085, 2301 N.E. Adams St., Peoria, Ill.**



COMPACT STORAGE—Lyon revolving bin storage units provide a good way to keep track of bulk nails, nuts, bolts, or screws. Shelves mounted on a strong shaft connected to a broad base revolve easily in either direction on ball bearings. The units are available in 4 or 7-shelf models, and each shelf has five permanent dividers. Shelves are stabilized to prevent sagging when they are unevenly loaded. The four-shelf model is 34 in. in dia and 37½-in. tall and the seven-shelf model is 34 in. in dia and 65 in. tall. Both are finished in baked enamel.— **Lyon Metal Products, Inc., Aurora, Ill.**



WHEEL TRENCHER — Parson's new crawler-mounted model 130 trencher digs up to 5¾ ft deep and up to 24 in. wide. The trencher features three wheel-speeds—

134, 277, and 337 ft per min.—and five digging speeds for each wheel speed. They permit a digging range of 12 in. to 18 ft per min. The Parsons 130 can dig 12, 16, or 20 in. trenches, with optional side cutters adding 2 or 4 additional inches. A single control on the 130 handles grading and hoisting of the digging wheel, and another control handles tilting of the mast. The trencher is powered by a six-cylinder Waukesha gasoline engine that delivers 52 hp. A Hercules diesel engine is optional. Travel speeds of the 130 are 1.09, 1.93, and 2.74 mph. The trencher has an 8-ft long arc-type conveyor that is shiftable and reversible. A mechanical conveyor drive is standard but this can be replaced with a hydraulic drive to provide a wide range of conveyor belt speeds that are independent of wheel speeds. The conveyor belt is 24 in. wide. The 130 rides on 12-in., tractor-type crawlers. Shipping weight of the unit is 13,600 lb.—**Parsons Co., Koehring Div., Newton, Iowa.**

TOPPLES BIG TREES—Rome's new land clearing blade has cut trees up to 81-in. in dia in tests, leaving stumps sheared off cleanly at ground level. Called the K-G blade, it cuts and windrows a wide swath of small to medium size trees in one continuous pass Larger trees are cut individually It can handle large trees after firs. splitting and weaking them with a snarp "stinger" that is an integral part of the blade. The Rome K-G blade is available through Caterpillar dealers in sizes to fit the Caterpillar D4, D6, D7, D8, and D9 crawler tractors. It is supplied either as a complete unit, including push frames, or it can be adapted to fit Caterpillar C frames. — **Rome Plow Co., Cedartown, Ga.**

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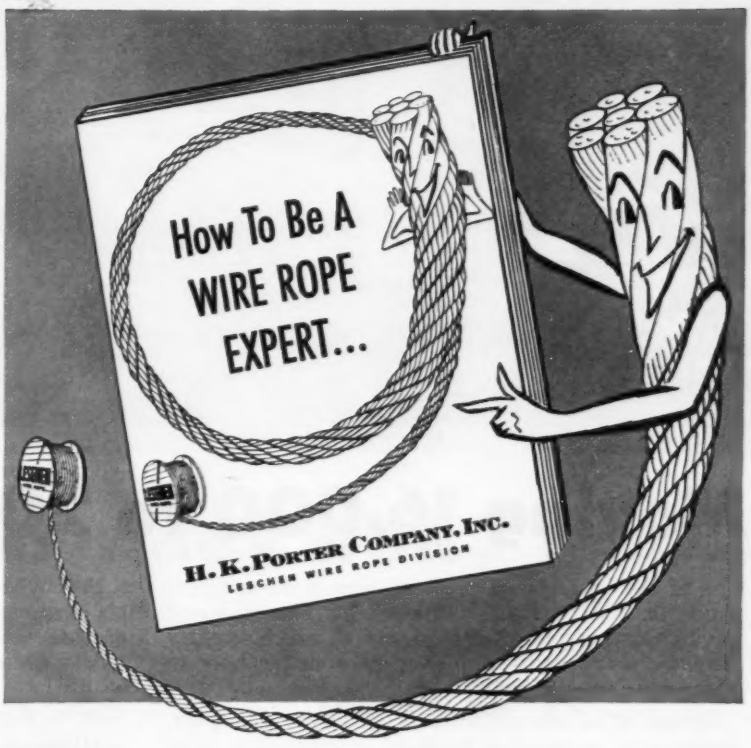

Yours for the asking...Illustrated 16-page book of pointers on how to select the right wire rope for any job!

Knowing how to select the best wire rope for the job not only helps reduce costs, but it may also help you to get that job done more efficiently. You'll find the facts you need to know in the book shown above. It has been specifically edited and illustrated for easy understanding by non-technical readers. It describes the forces that tend to destroy wire rope and then, step by step, shows how to determine which wire rope construction will provide the greatest possible resistance to the destructive forces you have found most troublesome. It's an interesting and helpful aid that every wire rope user ought to have. Send for free copy today. Write H. K. Porter Company, Inc., Leschen Wire Rope Division, 2727 Hamilton Ave., St. Louis 12, Missouri.

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WIRE ROPE

H. K. PORTER COMPANY, INC.
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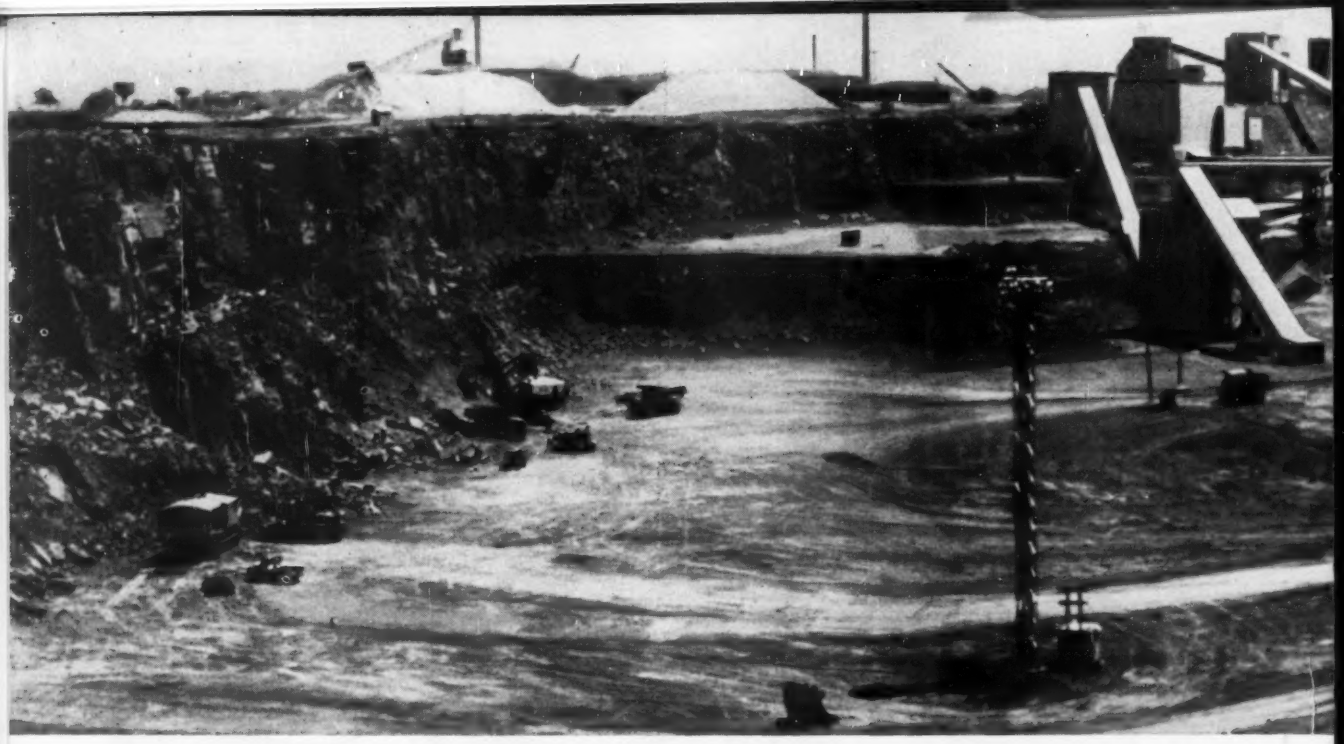

Moving 16,000 to 20,000 tons of

One of the biggest and most efficient stone-crushing plants on this continent is owned by The Highway Paving Company Limited of Montreal, which recently increased its capacity from over 400 tons per hour to over 1600 tons per hour.

Almost all of this operation is automatic. However, quadrupling production involved moving rock from quarry face to crusher in sufficient quantity to assure Highway Paving's booming operations of a continuous supply of crushed stone.

Seven Macks were given the job. Working under six-yard electric shovels, they shuttle from shovel to crusher, each making 10 trips an hour; the seven trucks average over 16,000 tons per day. The shovels really have to move to keep up with the hustling Macks, which are on the go 10 hours a day.

Highway Paving knows that its production of crushed stone is dependent on equipment that must maintain "the pace that kills", day after week after month, without crippling breakdowns. Their Macks

Mack being loaded by one of the six-yard electric shovels. The Macks take a brutal beating from the seven-ton impact of broken limestone dropped with each shovel pass . . . but come right back for more.

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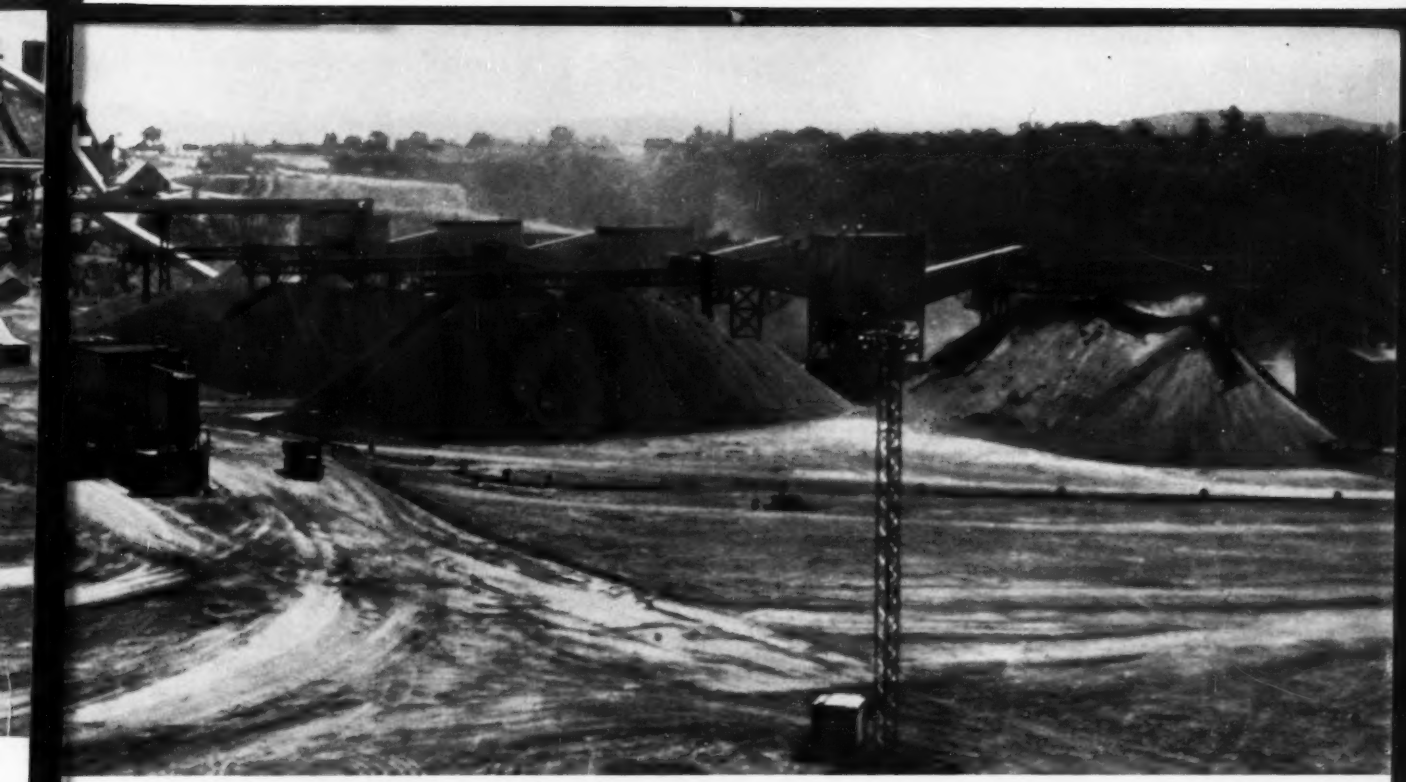

rock per 10 hour day with 7 trucks

have proved that they are worthy of this dependence. In fact, no other make of dump vehicle is used in this quarry.

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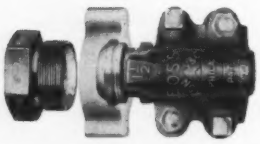

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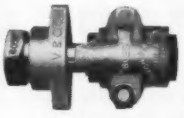

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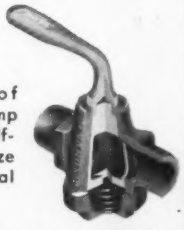

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New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

CONCRETE FORMING—A new 56-p catalog describes the complete line of concrete forms, form ties, accessories, construction specialties, and highway products.—**Universal Form Clamp Co., 1238 North Kostner, Chicago 51, Ill.**

SHOVELS AND CLAMSHELLS—Schield Bantam has issued two new specification sheets on their equipment. Bulletin A-266 covers the line of clamshell buckets including the general purpose ⅜-yd and special ½-yd rehandling buckets. Bulletin A-265 covers shovels of the same capacities.—**Schield Bantam Co., Waverly, Ia.**

STEEL BUILDINGS—"Armco Steel Buildings for Construction Projects," is a 34-p bulletin for contractors showing how steel building can be profitably used on job sites. Information on site planning, erection, and accessories is included.—**Armco Drainage and Metal Products, Inc., Product Information Service, Middletown, O.**

DERRICK JUMPING—This folder illustrates a basic method of raising a guy derrick from floor to floor on a building construction project without using other lifting equipment.—**American Hoist and Derrick Co., St. Paul 7, Minn.**

VIBRATING SCREENS—A 16-p catalog describes the four basic types of Deister vibrating screens designed to size all types of screenable material. — **Deister Machine Co., 1933 East Wayne St., Fort Wayne 4, Ind.**

MUD-JACKING—A 16-p catalog on the "mud-jack" method of preventing concrete slab failure and raising sunken areas to original grade describes the three models of mud-jack available. The application of the method is also explained. — **Koehring Division, Koehring Co., Milwaukee 16, Wis.**

continued on page 230

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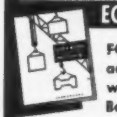

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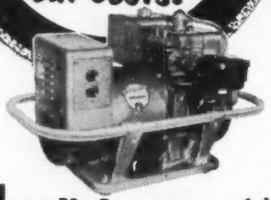

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NEW PUBLICATIONS . . .

continued

REDWOOD DATA—Information on redwood characteristics is contained on four 8½x22-in. charts published recently. The titles are "Grades and their Uses," "Standard Nailing Practices," "Standard Redwood Patterns," and the latest one, "Comparative Ratings."—**Simpson Redwood Co., Rm 311, Arcata, Calif.**

STRADDLE CARRIER — Complete specifications of the Series 71 straddle carrier of 12,000 lb capacity are contained in a 4-p brochure now available. The carrier is offered in nine models.— **Ross Carrier Division, Clark Equipment Co., Benton Harbor, Mich.**

WELDING — "Seven Keys to Welding Profit" is an 8-p booklet describing the use of the Cat twin arc-welder and some of its operating characteristics. — **Form D761, Advertising Division, Caterpillar Tractor Co., Peoria, Ill.**

FASTENERS—Two 12-p catalogs describe Huckbolt fastening devices. Form 8-414 covers commercial fasteners and driving tools. Form 8-416 covers industrial and commercial applications and tools. Both booklets include specifications and driving instructions.—**Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.**

DREDGES—A 12-p bulletin describes the portable hydraulic pipe line dredges made by Ellicott. Performance charts and applications around the world are given for the "Dragon" model.— **Bulletin 925, Ellicott Machine Corp., 1611 Bush St., Baltimore, Md.**

GRINDING DRILL BITS—A 6-p brochure describes percussion and rotary rock drill bit grinding. How and when to grind and the selection of grinding wheels is covered. — **Bay State Abrasive Products Co., Westboro, Mass.**

SCRAPER CATALOG — "Designed for a New Era in Earthmoving" is the title of a 24-p catalog on the Model TS-24 Euclid "Twin" scraper. The booklet covers all features of design, operation, and performance of this

BOOK NEWS

CONTRACTS, SPECIFICATIONS, AND LAW FOR ENGINEERS

You can insure greater protection for yourself and your clients in drawing up construction contracts with the help of this practical legal guide. Shows how to apply basic principles of contract law to drawings, specifications, surety bonds, instruction to bidders, and related areas. Scores of examples and sample paragraphs illustrate sound practice. **By C. W. Dunham, Assoc. Prof. of Civil Engrg., Yale U., and R. D. Young, Atty., Travelers Insurance Co. 550 pp., illus., $7.50**

ESTIMATING CONSTRUCTION COSTS

Here are the practical considerations you need to know to make accurate estimates on engineering projects—the understandable methods and helpful data you need for realistic, sound estimating. Each major type of construction is covered in detail not only on materials, labor, and equipment, but on overhead and profit as well. Over 100 time-saving tables help you make speedy, accurate estimates. **By R. L. Peurifoy, Prof. of Civil Engrg., A&M College of Texas. 350 pp., 60 illus., $8.00**

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This book shows you how to plan and carry out construction jobs using **the best combination of field-tested methods and engineering fundamentals.** How to analyze the project, prepare all schedules, and choose and manage the best equipment and methods for any given job is covered in great detail. Worked-out illustrative examples make all explanations crystal clear. **By R. L. Peurifoy, A.&M. College of Texas. 533 pp., 385 illus., $8.50**

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Over 500 questions and complete answers to help engineers pass state license examinations. Covers mechanical, electrical, civil, and chemical engineering, and includes engineering economics and land surveying. Latest questions—suitable for all states. Author has worked on New Jersey examination preparation for 19 years. By William S. LaLonde, Jr., 462 pp., 234 illus., $6.50.

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Truck-mounted A-W Hydraulic Crane Equipped with ½-yd. concrete bucket shown working on job for Western Gravel Co.

A-W Hydraulic Crane shows versatility at Western Gravel Co. plant

Western Gravel Company, Campbell, Calif., produces rock, sand and gravel and also sells Redi-mix concrete, made in two fully automatic batch plants. More than a year ago, this company bought an Austin-Western Hydraulic Crane unit for work in its own yard and to rent to customers. Mounted on a 6-wheel Army truck which has a platform large enough to transport a ½-yd. concrete bucket or a ⅜-yd. clamshell bucket, the crane has an 18-ft. extensible boom with a 17-ft. manual extension. Four hydraulic outriggers are used to give extra stability on heavy lifts.

Saves downtime of batch plant. Western Gravel reports: "Downtime of one of our batch plants not only costs the loss of the plant's production, but we lose the value of perhaps 10 of our Redi-mix trucks, worth $8 an hour apiece. Not only this, but our contractor-customers may suffer because gangs on the jobs are idle and there are also equipment rental losses. These losses may easily snowball into $300 an hour. Using the A-W, we can now change heavy motors on the plant in 30 minutes, an hour less than formerly. The value of this one hour saved might equal a month's cost of owning the A-W."

Popular with customers. "On most jobs, when a contractor rents a large crane he has to pay the moving cost and setup time for many more hours than he pays for renting our lower-rate A-W, which goes and comes so much faster and is ready to work minutes after it arrives."

Extremely versatile. "We used the crane to assemble our second batch plant. It lifts engines out of earth-moving machines and tractors... hoists sacks of admixtures up 20 ft. to floor of batch plant.... In our operation there seems to be nothing it cannot do to save time and labor in lifting things."

For the complete Western Gravel Co. story, write for Gould Certified Report No. 5601.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

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Keep water IN—
Keep maintenance DOWN!

Don't take chances with that costly swimming pool.

If it is made of concrete, it is porous—if it is porous, thousands of gallons of water will enter and finally deteriorate the masonry—causing it to crack.

Make the FIRST COST the LAST COST!

Ask your contractor to make sure it is watertight by using THOROSEAL to seal the surface. THOROSEAL is available in many attractive colors.

Thoroseal is not just a coating for masonry, it is a filling sealer that becomes a part of the masonry and protects it from deterioration.

"How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.

NEW PUBLICATIONS . . .
continued

24-yd scraper.—**Form 554, Euclid Division, General Motors Corp., Cleveland 17, O.**

KOEHRING STORY—"This is Koehring" is a 40-p brochure presenting a history of the company, its divisions and subsidiaries.—**Koehring Company, 3026 West Concordia Ave., Milwaukee 16, Wis.**

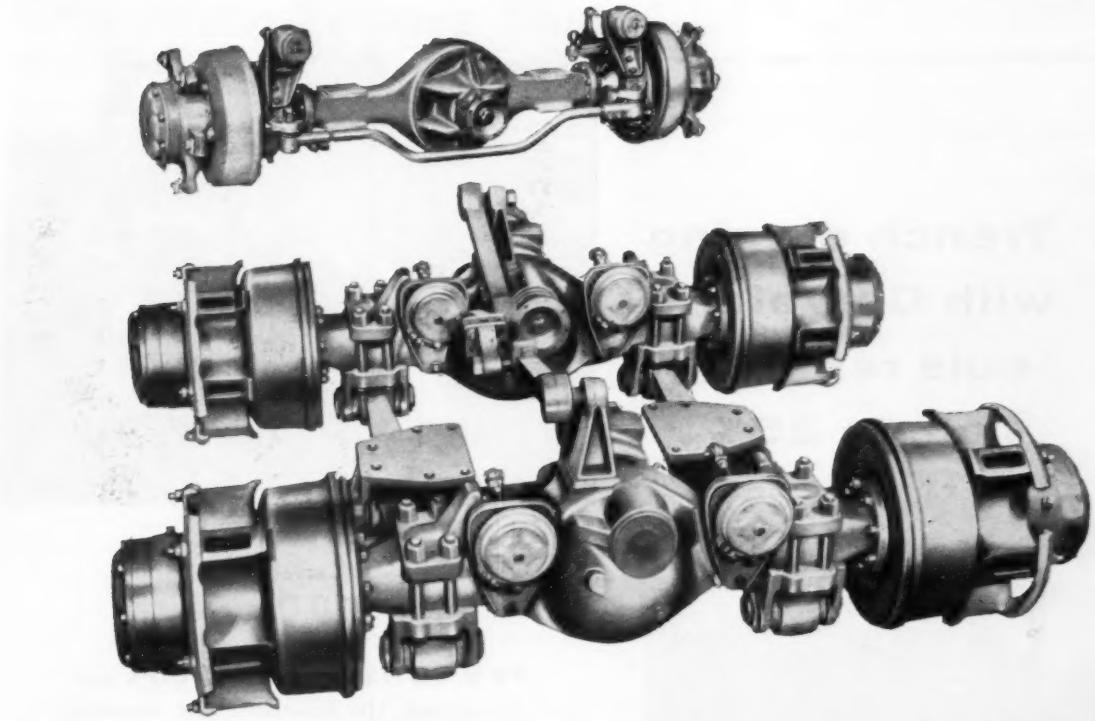
CONSTRUCTION HANDBOOK—A new and enlarged pocket-size Construction Data Handbook has just been published by the A. C. Horn Co., Inc., a subsidiary of Sun Chemical Corp. The 160-p booklet contains tables and charts to help solve many construction problems.—**Sun Chemical Corp., 10th St. and 44th Ave., Long Island City 1, New York.**

BUCKET DRILLING — "Methods Manual" is a new 16-p booklet describing bucket drilling as a method of excavation for tank burial, foundations, and other digging jobs. The method features speed and the elimination of hand digging.—**Calweld Inc., 7222 E. Slauson Ave., Los Angeles 22, Calif.**

MAINTENANCE GUIDES—Caterpillar has put out two new maintenance guides for operators. Form DE768 covers D2, D4 and D6 tractors. Form DE730 covers 933, 955, and 977 Traxcavators. —**Advertising Division, Caterpillar Tractor Co., Peoria, Ill.**

GRAVEL TREATMENT—An 8-p booklet describes gravel beneficiation, a new low cost process for up-grading aggregate developed by Blaw-Knox. The key to the method is the fact that hard stones bounce far while soft stones have little bounce. This enables different grades of aggregate to be separated by elastic fractionation at a relatively low cost.—**Gravel Beneficiation, Construction Equipment Division, Blaw-Knox Co., Mattoon, Ill.**

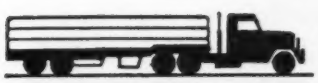
FILING COSTS—A 28-p manual, "How to Measure Your Filing Costs and Efficiency," offers advice on how to appraise and improve a filing system.—**Publicity Department, Remington Rand, 315 Fourth Ave., New York 10.**



Meet the new Heavyweight Champ

CLARK Tandem Drive

for 4 x 6 and 6 x 6 units with TWO PLANETARY AXLES



For greater strength and reduced weight—for minimum wear and maximum life—for virtual *elimination* of broken axle shafts and costly down-time—

- **You've never seen the equal of Clark's new Tandem Drive with two planetary axles**

  See how this revolutionary design slashes costs, swells profits

- **70% torque reduction on shafts**—Final reduction by means of the planetary drive in the wheels eliminates torsional wind-up in the shafts—practically puts an end to the common broken-shaft nuisance.

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(Advertisement)

Trench digging with Cleveland cuts repaving costs 25%

ERN CONSTRUCTION CO's new Cleveland 110 Trencher cut repaving costs 25% on the installation of 11,000 feet of 12 and 8 inch pipe throughout East Brunswick Township near Springfield, New Jersey. Trench was 5½ feet deep and 24 inches wide. Foreman Henry Appleby says:

> **"We're able to reduce repaving costs 25% with the Cleveland because it cuts cleaner, narrower trench than the backhoe method we used previously."**

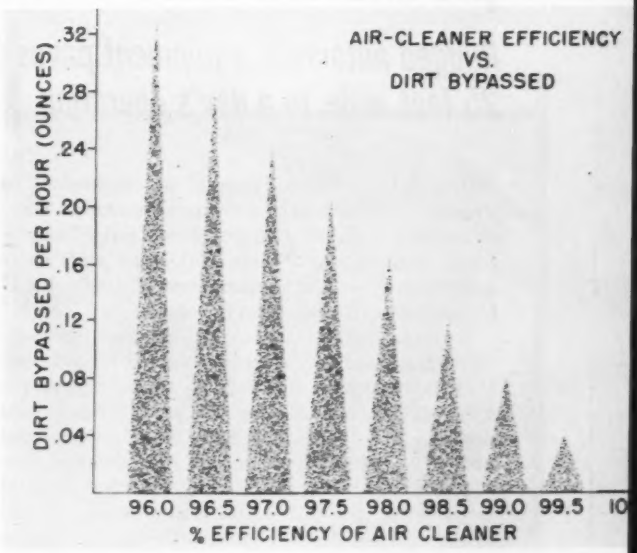
"We get better production, too," says Appleby. "The Cleveland digs about 780 feet of trench per hour compared to about 100 to 150 feet with the backhoe."

Good Everywhere

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

Diesel In Danger When Air Cleaner Efficiency Drops

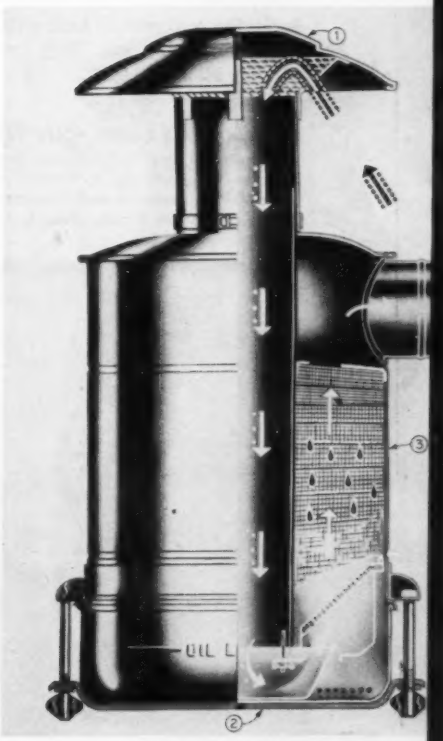


LIFE SAVER—Air cleaner working at 96% efficiency passes enough dirt in a year to ruin a diesel engine. Proper maintenance boosts air cleaner efficiency to 99.5%.

EVERYBODY agrees that dirt is bad for a diesel engine, but that's like saying war is hell. The Euclid Division of General Motors Corp., however, cites some startling facts to back up its contention that dirt is a diesel's deadliest killer:

- If a big scraper had to carry a filtered air supply capable of burning a single tank of fuel, the air tank's capacity would have to be 1,000,000 gal. And airborne dirt is the main source of engine contamination.
- If an air cleaner works at 96% of efficiency—only 4% less than perfect—the diesel engine in a scraper working 3,500 hr a yr would take in about 70 lb of dirt. Even if all but 1% were blown out the exhaust or washed away by lubricating oil, more than 11 oz would remain.
- It takes only 8 oz of dirt to finish off a high-speed diesel engine.

A shortened life expectancy is not the only effect dirt has on an engine, Euclid warns. While suffering its dirty death, the engine's operating efficiency drops drastically and quickly as dirt builds up on vital parts. Dirt-scored pistons, cylinders, and valves cause these components to stick;



TYPICAL CLEANER—Donaldson air cleaner traps dirt at (1) primary screen, (2) oil cup, and (3) lower screen assembly.

CATCHES MOST DIRT—Lower screens should be washed, then blown out. Hold them up to light to check cleanliness.

(Advertisement)

Blaw-Knox paving equipment helps set production record on Illinois Toll Road

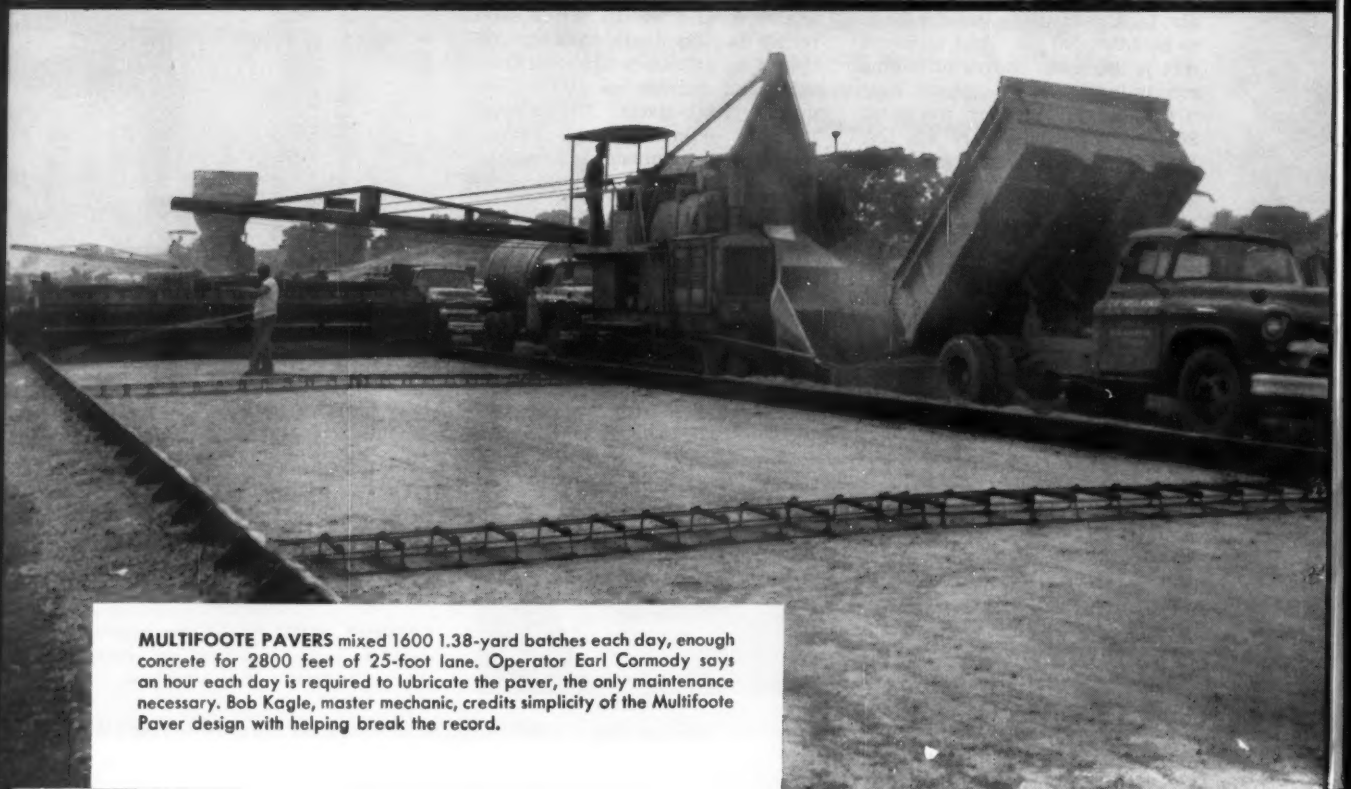
Rugged automatic equipment paves 3100 feet of 10-inch reinforced concrete, 25 feet wide, in a day's operation

Anthony Constantino, general superintendent for John C. Peterson Construction Corporation credits the "high efficiency and durability of the Blaw-Knox Machines" his company used on the Illinois Toll Road with an outstanding contribution to the performance of the John C. Peterson Construction Corporation Forces.

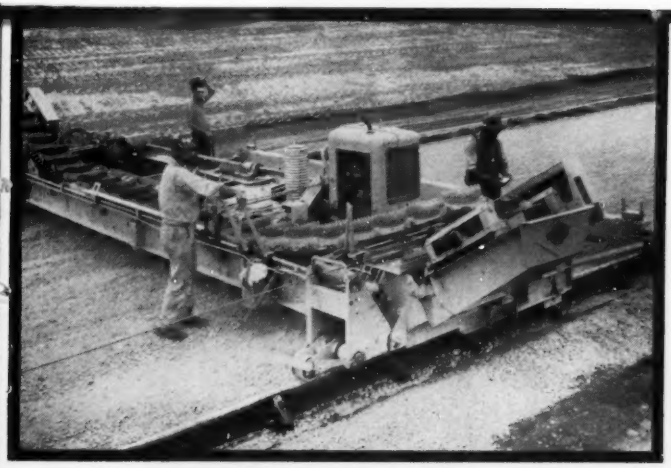
Reynold (Scotty) Scott, paving superintendent states that "The machines took a terrific beating by constant usage, but they have proven themselves to be rugged, durable and efficient. Any downtime would hold up the job with a serious financial loss, but with the Blaw-Knox Machines, we were able to complete our operation well ahead of schedule."

Record-shattering production to rigid specifications like those set for the Illinois toll road is being delivered time and again by Blaw-Knox Concrete Paving Equipment. All over America, contractors are squeezing more value out of their equipment dollar with Blaw-Knox machines. They're rugged, built for automatic, high production rates that mean more profit on every job. Why not see your Blaw-Knox dealer? He has all the details.

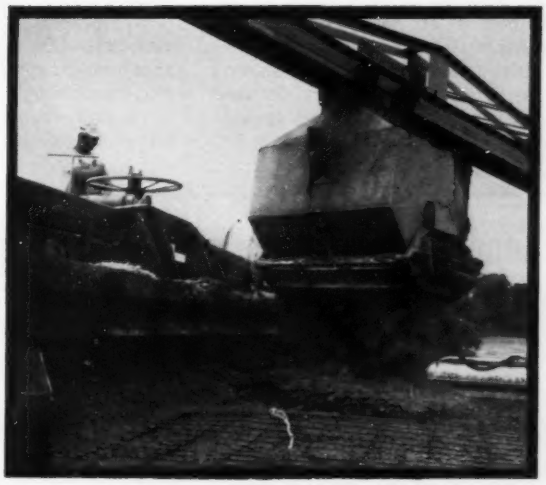
BLAW-KNOX PAVING EQUIPMENT USED: 10,000 10″ x 10′ self-aligning road forms—Precision Subgrader—two 34E Dual Drum Concrete Pavers—two Concrete Spreaders (one with vibrator)—Concrete finisher—Base Paver—Road and Shoulder Widener—Automatic Cement and Aggregate Batch Plants—four 6 cu. yd. HiBoy Trukmixers.



MULTIFOOTE PAVERS mixed 1600 1.38-yard batches each day, enough concrete for 2800 feet of 25-foot lane. Operator Earl Cormody says an hour each day is required to lubricate the paver, the only maintenance necessary. Bob Kagle, master mechanic, credits simplicity of the Multifoote Paver design with helping break the record.



BLAW-KNOX SUBGRADER cuts and levels the grade to the required 10" template. Running on Blaw-Knox road forms, the subgrader excavates by vibration of the forward edge of the cutting tool. Quick adjustable strike-off gives perfect final crown to the grade.

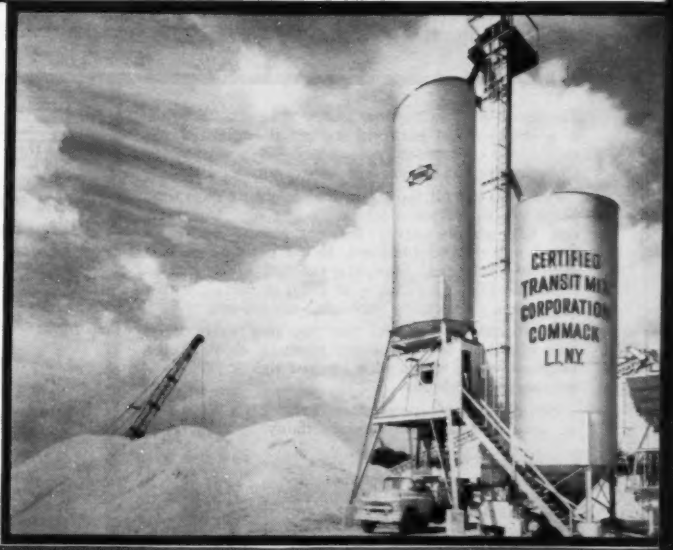


SPREADER distributes concrete uniformly to correct width and elevation without disturbing contraction joint baskets or reinforcing mesh. It is the only spreader that moves concrete longitudinally and transversely. Vibrator attachment consolidates and seals-off concrete for fast accurate finishing.

FINISHER strikes-off concrete to required crown and trowels surface, minimizing final floating operation. Quick crowning screed boards meet super elevated curves and tangent pavement requirements. Wide screed ends prevent spillage.

Electronically Controlled Batch Plant delivers once every 15 seconds

This Blaw-Knox automatic Batch Plant, owned by Certified Transit Mix Corporation kept 32 batch trucks rolling to the paving site seven miles away. Warren Morreale, plant superintendent, credits the smooth, high speed operation of 240 batches per hour with helping to set the paving record.



BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division

38 Charleston Avenue, Mattoon, Illinois

that means an immediate loss of power and excessive oil consumption. Dust-choked air cleaners and hoses restrict the engine's air supply; that results in incomplete fuel combustion and leads to the formation of heavy carbon deposits.

Dirt starts to sabotage an engine at its point of entry. Poured into the engine with the fuel, it attacks the fuel pump and injectors and then goes to work on the cylinders and valves. Lubricating oil that is contaminated with dirt makes a direct assault on the engine's vital underbelly —its bearings and pistons.

By far the greatest source of contamination is airborne dirt that gets past faulty air cleaners. Field tests made by one air cleaner manufacturer show that the efficiency of one of its units can be as high as 99.94% when it is serviced properly. The tests also show that efficiency can drop easily to 96% when an air cleaner is serviced poorly. This seemingly small drop in efficiency allows the cleaner to pass more than .3 oz of solid dirt every hour. This means that in less than a year an engine with a faulty cleaner will take in more than enough dirt to end its useful life.

POOR MAINTENANCE—It didn't take long for screen to build up this accumulation of dirt. Service these screens daily.

How Cleaners Fail

Euclid points out that poor air cleaner maintenance allows dirt to enter the engine in two ways: by reducing the dirt-filtering ability of the cleaner; and by allowing dirty air-cleaner oil to be pulled over into the engine. Both conditions can occur at the same time.

Air passing through the cleaner is drawn through an oil reservoir cup and up into a set of filter screens. The oil washes the dust from the incoming air, and then the screens condense the oil spray into droplets that flow back to the oil sump. Dirt washed out of the air by the oil settles to the bottom of the oil cup. As the oil cup fills with dirt, the oil thickens until it becomes too viscous to circulate freely through the air cleaner. This lessens the washing action of the oil and lowers the cleaner's efficiency.

If the cleaner is not adequately serviced, dirt builds up and displaces oil in the cup so that oil will be pulled over into the engine by the air stream. Dirty oil also can be pulled over from the air cleaner when screens become plugged.

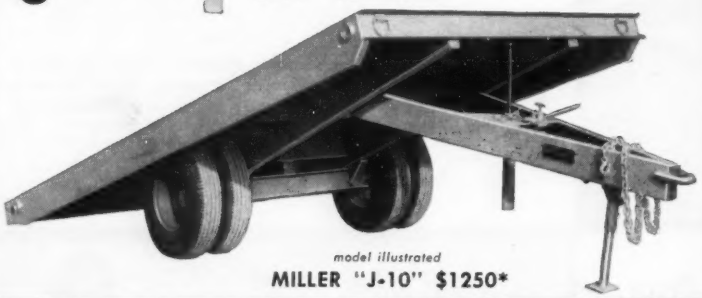
Airborne dirt also can get into an engine by by-passing the air cleaner completely. Loose hose connections, faulty gaskets, or small holes in the air cleaner out-

announcing a whole new line of single axle over-the-wheel platform trailers

NEW MILLER model "J" Tilt-Tops

available in 3 capacities

"J-6" six tons
"J-8" eight tons
"J-10" ten tons



model illustrated
MILLER "J-10" $1250*

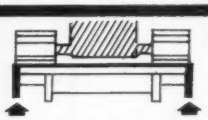
The new "J" line . . . more husky than the "B" line of over-the-wheel platform models it replaces . . . is introduced at *no increase in price* . . . again offers economy minded contractors *more capacity per dollar*.

And you get all the speed and handling ease that helps you cover more jobs *with one rig!* One man can tilt, simply drive the equipment onto the broad oak decked platform, be on his way in less than two minutes. Shuttling tractors or other rigs from one job to another is so easy, so fast . . . it can often save duplicating expensive equipment.

Each new "J" model has the new extra deep side channels for maximum strength right at the platform edges where wide tracked rigs impose heavy strains.

See these new production boosters at your MILLER distributors today.

*F.O.B. Milwaukee
Complete with platform and tires. Any optional equipment extra.
**Plus 10% Federal Tax*



new 10" deep side channels

Extra deep side channels integrally welded to heavy cross members, provide rigid support for the heavy strains imposed along the edges by wide tracked rigs.

"H" beam axle

Super tough, this H beam straight-thru axle has solid steel, stub inserts for extra strength over rough roads. Long life Timken roller bearings assure positive wheel alignment.

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✓built best ✓priced best

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How Allis-Chalmers engines bring out the best in any equipment

YOUR EQUIPMENT DOES MORE when powered by Allis-Chalmers high-torque, high-usable-horsepower engines. There is a minimum of pull down due to sudden loads, with quick recovery of engine speed — and real lugging power at slow speeds.

KEEPS WORKING DAY AFTER DAY. There is unusual simplicity in rugged Allis-Chalmers engines. Diesel models, for instance, have 30 to 50 percent fewer wearing parts than competitive engines. Less can go wrong when parts are fewer and stronger.

GETS BACK TO WORK FASTER. Simplicity means easier servicing, too, for Allis-Chalmers engines. They are back to work quickly because you are close to fast parts and service, wherever you are.

See your Allis-Chalmers dealer for full information on engines that will get the most out of *your* equipment — *any* type or size, 9 to 516 hp; *any* fuel, LP or natural gas, gasoline or diesel; for *any* application. Allis-Chalmers, Engine - Material Handling Division, Milwaukee 1, Wisconsin.

BC-10

ALLIS-CHALMERS *Engineering in Action*

All elements of this construction job in Toledo, Ohio proceed without interruption or slow-down due to cold, thanks to VISQUEEN film enclosures.

How To Get a Day's Work For a Day's Pay — ALL WINTER!

Cut Costs... Speed Construction With Seamless Sheets of VISQUEEN Film For Enclosures

TRADEMARK

Only VISQUEEN film gives you the advantages of *seamless* widths up to 32 ft. Enclosures go up faster, easier. Stay up with less chance of breakage because there are fewer seams. There's no delay in construction—no money tied up in unproductive labor—because VISQUEEN film enclosures keep cold out—let sunshine in. Workers are warm and comfortable—hence more productive. You get a day's work for a day's pay. For complete information on how contractors profit from VISQUEEN film enclosures, please mail the information request tag below.

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let hose can cancel out most of the cleaner's work by admitting dust directly into the engine. (Dirt that by-passes the air cleaner through an air leak of less than .5% of the total air flow will reduce seriously the engine's life.)

Air Cleaner Servicing

Air cleaner maintenance schedules are established by manufacturers for average operating conditions. If conditions are dustier than normal, it follows that air cleaners must be serviced more frequently. Conversely, if little dust is present, frequent servicing can be a waste of time. (But don't underestimate the amount of foreign matter present in the air. A fibrous material that comes from budding plants and trees in the spring is not visible, but any hay-fever sufferer will testify as to its presence. These fibers are one of the main causes of clogged air cleaner screens.)

Servicing procedures for the various makes of oil-bath air cleaners used on earthmovers are not identical, but they usually are very similar. Air cleaners generally use three stages—all contained in a single housing—to clean intake air. Some vehicles also are equipped with pre-cleaners or after-cleaners, but the main air cleaner does most of the work.

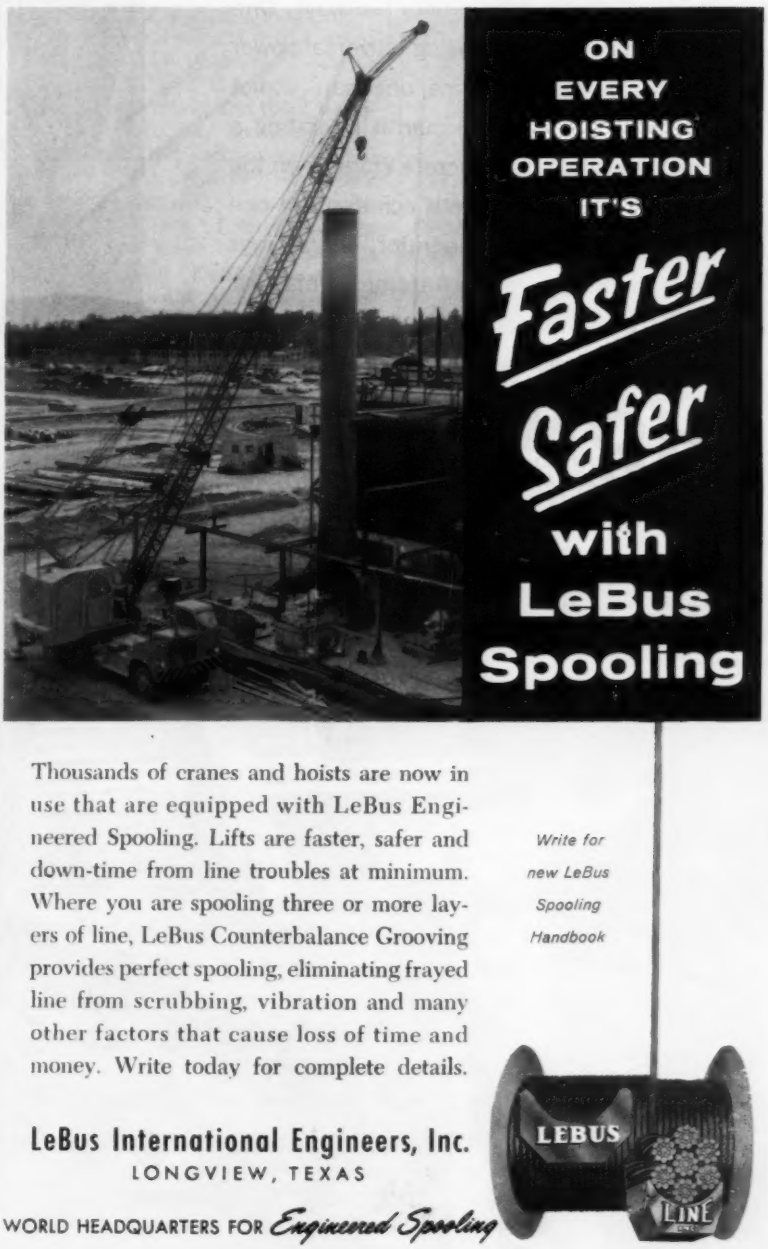
The primary screen in the air inlet cap of the main air cleaner needs frequent servicing. It must be kept free of leaves, paper, or other debris that might cut down the cleaner's efficiency even before it receives air. The central down-shaft tube also needs thorough cleaning at each servicing. This should be done with a cloth or soft brush. Euclid warns that the central tube should never be wiped with cotton waste.

The oil cup and lower screen assembly are the components that require the most careful attention because they trap and hold most of the dirt that passes into the cleaner. The level of dirt in the oil cup should never be allowed to rise more than ½ in., and the oil should not become thicker than SAE 40 from the absorption of dirt. When cleaned thoroughly, the cup should be refilled with clean oil of the recommended viscosity. Never refill the cup with dirty oil or crankcase drainings. This is foolish economy because it amounts to leaving part of the dirt in the cup. Moreover, crankcase drainings are more viscous than clean oil of the same weight, and they will not pass as readily through screens.

Never underfill or overfill the oil cup. An underfilled cup does not permit the air cleaner to function properly. Overfilling does not improve the air cleaner's efficiency; all it does is increase the danger of excess oil being pulled over into the engine.

Refill the cup with clean, inexpensive lubricating oil. It should not be heavy oil because it is used only to wash dust from the air, not to lubricate. Oil of SAE 20 viscosity generally is recommended for temperate climates, and SAE 10 is recommended in below-freezing temperatures.

The lower screen assembly is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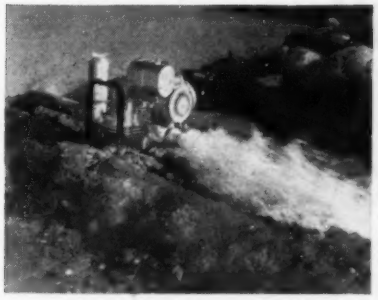

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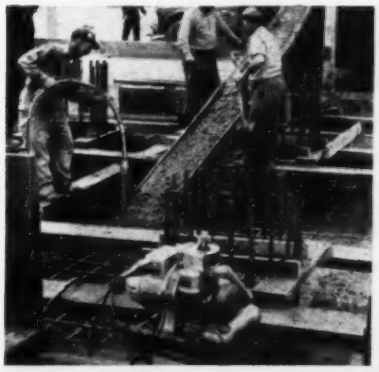

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MAINTENANCE SHOP . . . continued

the component that traps most dirt, fibrous material, and other foreign matter. Because of its construction, a plugged screen may go unnoticed—even after it has been "cleaned." After it is washed, it should be held up to a source of light, which will show up any remaining dirt. If washing fails to clean the screen thoroughly, blow it out with compressed air. Unless the screen can be cleaned completely, it should be replaced.

Many shops follow the practice of removing a dirty screen in the field and replacing it with a spare. Then the dirty screen can be cleaned back at the shop.

Upper screens, the third filtering element, may be either fixed or removable, according to the make of air cleaner. In either case, they should be flushed with a large volume of solvent under pressure if there is any sign of a dirt build-up. Euclid says upper screens should not be steam cleaned. This will not dissolve dirt that holds to screens; it bakes it on more securely.

Kerosene, diesel fuel, or some similar commercial solvent will dissolve oil and flush away dirt. Cleaners in which the upper screens cannot be removed should be dismounted from the vehicle and back-flushed. In either case, allow elements to dry out completely before reassembling the cleaner.

When reassembling an air cleaner make sure that all gaskets and O-rings are in their original positions and that all elements are securely fastened in place. Check all connections and hoses for air leaks. The entire air intake system should be tested periodically for air leaks, particularly if there is any indication of air cleaner damage. Euclid suggests that this be done as follows:

1. Inspect all connections for mechanical tightness.
2. Block off the air-cleaner inlet hood and blower outlet so that the air inlet system is sealed off. Then pressurize the system, but do not exceed 2 psi.
3. Paint all joints and seams with a soapy solution. A constant bubbling indicates the presence of an air leak.
4. Repair any leaks and recheck the system with the soapy solution.

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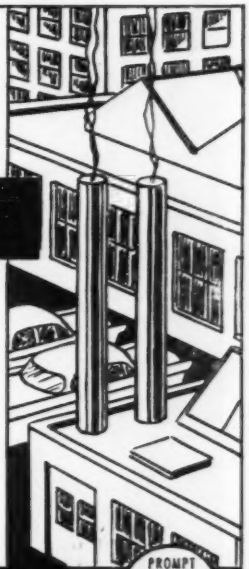

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Project: Road Improvement Along Delaware
Problem: Removing 10,000 cu yd of Limestone

Part of the road improvement program of the Pennsylvania Department of Highways called for the recent removal of some 30,000 cu yd of blue limestone from a 3.4-mile section of Route 611, paralleling the Delaware River at Riegelsville, Pa. Bethlehem 1¼-in. Hollow Drill Steel, fitted with carbide-insert bits, was used in boring blast holes.

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Bethlehem Hollow Drill Steel saves money in rock removal jobs because it has the ability to stay on the job. This is because it is rolled from fatigue-resistant steel, and has a centrally located, uniform hole. It has a wide quenching range. It is also easy to heat-treat for the proper balance of toughness and wear-resistance.

Bethlehem Hollow comes in Carbon and Ultra-Alloy grades in rounds, hexagons and quarter-octagons. It's worth specifying for your next rock drilling job.

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Methods Memo . . .

Record Blast

Every shot is a new record at Promontory Point, Utah, where Morrison-Knudsen is leveling a cliff more than 200 ft high to produce rock fill for a causeway across Great Salt Lake.

The fourth in the series, fired last month, produced more than 3,000,000 cu yd of rock. Like the others before it, it was a coyote-hole shot. It took 2,138,000 lb of Atlas explosives.

The biggest previous blast produced 2,000,000 cu yd of rock. Until last month, it had been billed as the largest non-atomic explosion ever fired (CM&E, Sept., 1957, p 194).

M-K is building the $49-million causeway across Great Salt Lake to replace a wood trestle of the Southern Pacific Railway.

Bang Away

A New Jersey contractor is putting Army tanks to work on a big demolition job in Trenton, N. J.

Carmen Ottilio, head of V. Ottilio & Sons of Paterson, N.J., bought five surplus M-47 tanks, each 45 tons of steel, from the government. He says they are the first operational tanks released for civilian work by the Army.

Each of the tanks cost about $75,000 new. Ottilio won't tell how much he paid for them, but he says he got "a real buy."

He plans to use them for all types of demolition. The Trenton job, where they went to work early this month, involves leveling 280 wood and brick structures, up to five stories high, to clear the site for a housing project.

The tanks get only about 0.58 miles to a gallon of gasoline, but Ottilio is convinced they will prove economical. He uses them like self-propelled battering rams to knock out walls, letting the roof fall down on the heavily armored tank which then crawls out from under the wreckage.

Ottilio says he expects to complete the big Trenton demolition job with the tanks much faster than he could with cranes swinging iron balls and bulldozers.

Something to Watch

There's a lot of business for earthmoving contractors in a little-known federal program called the Small Watershed Program.

Total construction over the next several years is estimated at about $6.3 billion. That may turn out to be conservative. The Soil Conservation Service of the U.S. Department of Agriculture says there are about 16,500 watersheds in the U.S. and its possessions that urgently need conservation construction.

Probably individual contracts rarely will exceed $100,000. So a lot of small contractors—with only three or four earthmoving machines—will be able to participate. In all some 18,000 contractors may handle one or more of these contracts.

The program is just getting started. The federal government had approved only 60 applications for construction as of last Nov. 1. Another 722 applications are pending.

The multi-purpose projects for flood control, irrigation, drainage, municipal or industrial water supply, and recreation are initiated by local organizations and approved by the state. The Department of Agriculture helps the local organizations plan and carry out the work.

Outstanding Performance

Contractors on the St. Lawrence Seaway are setting an example for the industry. Last year Perini Corp., sponsoring contractor on Grasse River Lock, was honored by the National Safety Council for an outstanding safety record. This year, Morrison-Knudsen Co., Inc., gets the honor award for an outstanding safety record in construction of Dwight D. Eisenhower Lock, a project for which M-K is sponsoring contractor.

The record speaks for itself. M-K's accident frequency rate was more than 80% below the 1957 average of the heavy construction industry. And M-K with associates put in nearly 2,000,000 manhours of work during the year.

During the two years and nearly 3,500,000 manhours of work since the project began there has been only one fatality on this job.

John Armitage, M-K project manager, accepted the award from F. W. Braun, vice president in charge of accident prevention for Employers Mutuals of Wausau, which insures the job.

But Match This

The top construction safety record belongs to a 400-man construction force of Du Pont Co. These men at Du Pont's Chambers Works in Deepwater Point, N.J., have gone nearly eight years and worked more than 7,500,000 hours without a lost-time accident. During the last 25 years, they have not suffered a single fatality.

1.

A wizard builder, Richard Lord was rarely underbid,
Yet used to turn a tidy sum on every job he did.
Alas, a streak of accidents upset his apple cart.
Insurance costs soared crazily. Dick's profits fell apart.

2.

Forthwith a Travelers man blew in. "Allow me, sir," said he.
"With *Travelers* Workmen's Comp and Public Liability
A hawkeyed safety engineer spots dangers at your site—
Erases unsafe methods—sees the job is handled right.

3.

"'A stitch in time can save you nine'—we prove the adage true.
Your men have fewer accidents. And costs go down for you.
And if a mishap *does* befall and get you into trouble
A stalwart, trusty Travelers man will see you on the double."

4.

"The worry's his—not yours—because The Travelers never stops
Till everything's just dandy and your worker's feeling tops."
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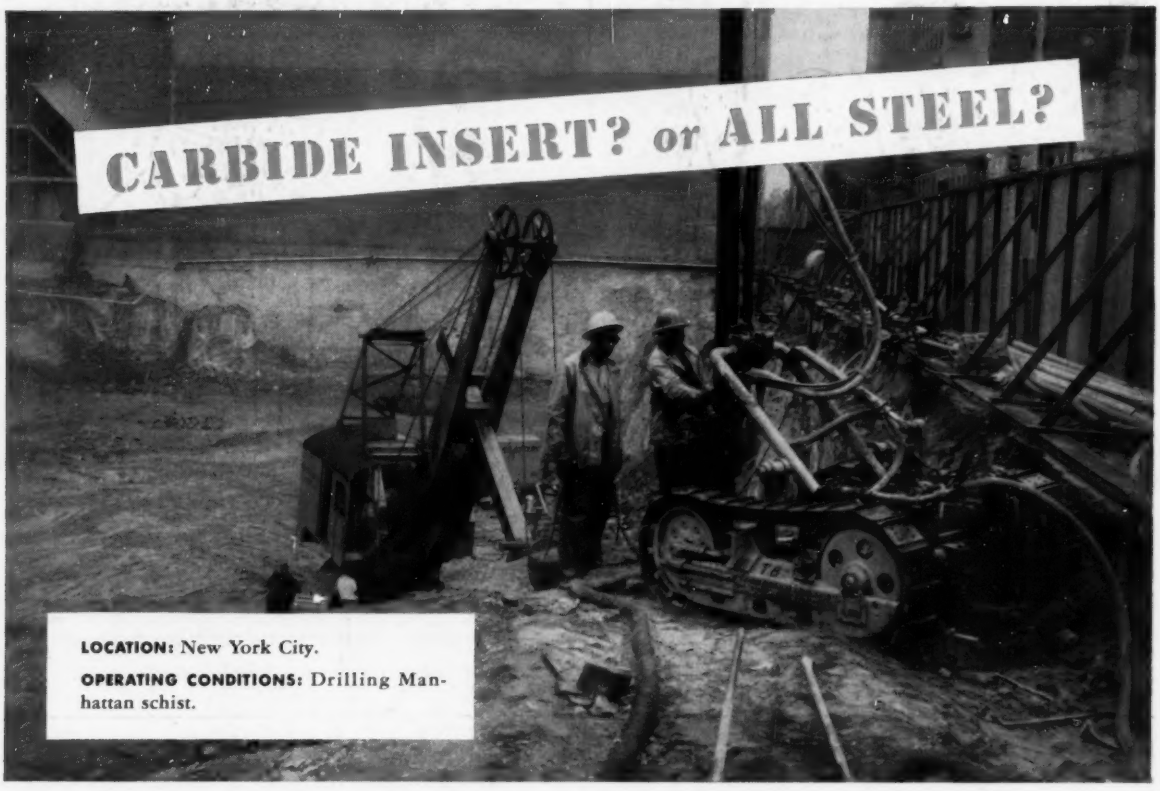

"We get faster drilling with fewer bit changes using TIMKEN® carbide insert bits"

. . . Reports Slattery Contracting Co., Inc.

EXCAVATING for the new TIME-LIFE Building in New York City, Slattery Contracting Company, Inc., had to drill extremely deep, constant gage holes through hard, abrasive Manhattan schist. They held bit changes to a minimum, stepped up drilling speed and got lowest cost per foot-of-hole with Timken® threaded carbide insert bits.

For jobs like this you'll find that Timken carbide insert bits give maximum speed and economy.

Yet carbide insert bits aren't always best for every drilling job. In softer, less abrasive ground Timken all steel multi-use bits are your best bet. With correct and controlled reconditioning, they hold your cost per foot-of-hole to a minimum in ordinary ground when full increments of steel can be drilled.

Your drillers save time with either Timken carbide insert bits or all steel multi-use. Both are interchangeable in the same thread series, and dozens of different bits fit the same drill steel. Bits can be changed easily and quickly—right on the job!

All Timken rock bits are made from our own fine alloy, electric furnace steel. And to protect their threads against drilling impacts, Timken bits have a specially developed shoulder union.

So why not get all these advantages on your next drilling job? To make sure you get the type of Timken bit that meets your particular needs, just call or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded all steel multi-use rock bit

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